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Title:

American mine
accounting

Place:

New York

Date:

1913

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Charlton, William Hurst, 1875-
American mine accounting: methods and forms employed by leading mining companies, by W. H. Charlton ... New York [etc.] McGraw-Hill book company, 1913.
viii, 367 p. incl. illus., forms. 24^{cm}. \$5.00
Page 367 missing.

1. Mining industry and finance—Accounting.

Library of Congress
Copyright A 332037

HF5686.M6C5 13-1420

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AMERICAN MINE ACCOUNTING

*METHODS AND FORMS
EMPLOYED BY LEADING MINING COMPANIES*

BY

W. H. CHARLTON, P. A.
Member Lake Superior Mining Institute

McGraw-Hill Book Company
239 West 39th Street, New York
6 Bouverie Street, London, E. C.

1913

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PREFACE

While engaged as accountant with various copper-mining companies in the Lake Superior District, covering a period of twelve years, I was impressed with the fact that the subject of mine accounting was not being given the attention in technical literature that it might well receive, there being to my knowledge only three books published on the subject in the English language, one in this country, one in England and one in Scotland.

The result was that I set about the compilation of the material in this volume, which are the practical working systems of companies representative in their particular fields of mining, believing that this treatment of the subject would be more generally appreciated than a theoretical discussion.

I have included in the accounting system of the Ojibway Mining Co. methods for a mill, in order to round out the subject, although this company has not built a mill at the present time.

There will no doubt be found errors, both of omission and commission, although I have endeavored to avoid them as much as possible; however, I will be glad to correct in future editions any inaccuracies that are brought to my attention.

I wish to acknowledge the many courtesies of my friends who assisted in gathering together and preparing the material in this volume. I am particularly thankful to Mr. E. B. Wilson, editor of "Mines & Minerals," for the use of the articles: "Recording Engineering Data at the Calumet & Arizona Mine," "Recording Engineering Data at the Boston & Montana Con. Mine," and "Recording Geological Data at the Calumet & Arizona Mine"; also to Mr. E. E. Whiteley, Mr. Lee Hayes and Mr. Thorald F. Field, the respective authors of these articles. I am also indebted to Mr. L. E. Camomile, Manager of "Mines & Methods," for the use of the material in the chapter on the methods of the Utah Con. Mining Co., which originally appeared in that journal.

In conclusion I commend this volume to the kind consideration of mining men in general and mining accountants in particular, with the hope that it will be of material benefit to the mining industry of this country.

W. H. CHARLTON.

DETROIT, MICH.
December, 1912.

CONTENTS

CHAPTER I

| | Page |
|---|------|
| MINING IRON ORE. OLIVER IRON MINING CO. | 1 |
| Operating Conditions, Lake Superior District | 1 |
| Mines Operated by Oliver Iron Mining Co. | 1 |
| General Ledger Accounts, Head Office | 3 |
| Sub-ledger Accounts, Head Office | 5 |
| General Cost Sheet, Head Office | 6 |
| General Office Accounting, Head Office | 6 |
| Chart of Mine Accounts, Mine Books, Underground Mines | 26 |
| Administrative Expenses, Mine Books, All Mines | 28 |
| Distributing Accounts, Mine Books, All Mines | 28 |
| Mining Expense Accounts, Mine Books, Underground Mines | 32 |
| Surface Expense Accounts, Mine Books, Underground Mines | 33 |
| Chart of Mine Accounts, Mine Books, Open Pit Mines | 35 |
| Mining Expense Accounts, Mine Books, Open Pit Mines | 36 |
| Mine Office, Accounting, All Mines | 39 |

CHAPTER II

| | |
|--|-----|
| MINING AND MILLING NATIVE COPPER. OJIBWAY MINING CO. | 58 |
| Operating Conditions, Lake Superior District | 58 |
| Head Office Accounts | 58 |
| Chart of Mine Accounts, Mine Books | 63 |
| General Ledger Accounts, Mine Books | 64 |
| Shop Accounts, Side-ledger, Mine Books | 74 |
| Closed Accounts, Side-ledger, Mine Books | 75 |
| Sub-accounts, Side-ledger, Mine Books | 95 |
| General Accounting, Mine Books | 107 |

CHAPTER III

| | |
|---|-----|
| MINING COPPER ORE. UTAH CON. MINING CO. | 149 |
| Operating Conditions, Bingham Mining District, Utah | 149 |
| Operating Accounts, Mine Books | 150 |
| Reports and Graphic Records | 152 |
| SMELTING COPPER ORE.—CALUMET & ARIZONA MINING CO. | 168 |
| Plant and Smelting Operations. | 168 |
| Chart of Accounts, Smelter Books | 169 |
| Expense Accounts | 169 |
| Closed Accounts | 174 |
| Shop Accounts. | 180 |
| Accounting, General Statement | 180 |

CONTENTS

CHAPTER IV

| | PAGE |
|--|------|
| MINING COAL AND MAKING COKE. UTAH FUEL CO. | 203 |
| Operating Conditions in Utah | 203 |
| Chart of Accounts, General Office | 205 |
| General Ledger Accounts | 206 |
| Coal Expense Sub-accounts | 210 |
| Coke Expense, Sub-accounts | 213 |
| General Office Accounting | 215 |
| Mine Office Accounting | 235 |
| Wasatch Store Co. | 268 |

CHAPTER V

| | |
|---|-----|
| MINING AND MILLING GOLD ORE. THE PORTLAND GOLD MINING CO. | 275 |
| Operating Conditions Cripple Creek District, Col. | 275 |
| Head Office Accounts | 277 |
| Chart of Mine Accounts, Mine Books | 282 |
| General Accounts, Mine Books | 283 |
| Sub-accounts, Mine Books | 285 |
| Distributed Accounts, Mine Books | 288 |
| General Statement of Accounting | 297 |

CHAPTER VI

| | |
|--|-----|
| ENGINEERING AND GEOLOGICAL DATA | 317 |
| Recording Engineering Data, Calumet & Arizona Mng. Co. | 317 |
| Recording Engineering Data, Boston & Montana Con. C. & S. Mng. Co. | 325 |
| Recording Geological Data, Calumet & Arizona Mng. Co. | 335 |
| INDEX | 343 |

CHAPTER I

MINING IRON ORE

ACCOUNTING METHODS OF THE OLIVER IRON MINING COMPANY

In the Lake Superior District, iron ore is found distributed over a wide area of country. In the Michigan and Wisconsin ranges the ore is found in blanket formations, which are developed by both vertical and inclined shafts, drifts being run into the ore bodies at convenient levels. Stopes are opened into the ore body from the drifts at regular intervals. The ore is broken down in the stopes with machine drills; it is then loaded in cars, trammed to the shaft and hoisted to the shaft house, crushed and either loaded direct into railroad cars for shipment or placed on the stockpile, to await the opening of navigation. From the mines the ore is shipped in railroad cars to the ore docks located at convenient lake ports. From there it is forwarded to Lake Erie ports in steamships.

On the Minnesota ranges the ore is found in blanket formation near the surface of the earth. A great many of these mines are worked as open pits. The surface formation is stripped off the ore by steam shovels. Railroad tracks are laid directly onto the ore body, the ore is broken with dynamite and loaded directly into the railroad cars with steam shovels; it then goes to the ore docks at the nearest lake port, where it is loaded into vessels for shipment to lower lake ports. From the lower lake ports the ore finds its way to furnaces in the Pittsburgh District, where it is reduced to commercial iron and steel.

The Oliver Iron Mining Company and its subsidiary companies operate the following mines on the different ranges:

| Range | District | Mines |
|----------------|----------------|--|
| Marquette..... | Marquette..... | Section 21. Section 16. Queen. Hartford. Hard Ore. Hematite. Moore. Stegmiller. Winthrop. Champion. |

| Range | District | Mines |
|----------------|--------------------|--|
| Menominee..... | Iron Mountain..... | Chapin. Aragon. Cundy. Iron Ridge. Pewabic. |
| | Crystal Falls..... | Michigan. Mansfield. Riverton. Hilltop. Cuff. |
| Gogebic..... | Ironwood..... | Aurora. Atlantic. Chicago. Davis. Norrie. Puritan. Tilden. |
| Vermilion..... | Ely..... | Chandler. Pioneer. Savoy. Sibley. Soudan. Zenith. |
| | Mountain Iron..... | Mountain Iron Stephens. Virginia. Sauntry. Higgins. Union. |
| Mesabi..... | Eveleth..... | Adams. Spruce. Auburn. Fayal. Geneo. Duluth. Biwabik. Gilbert. McKinley. |

| Range | District | Mines |
|-------------|---------------|--|
| Mesabi..... | Hibbing..... | Burt. Clark. Chisholm. Hull. Pillsbury. Rust. Sellers. Glen. Day. St. Clair. Penobscot. Hull-Rust. Leonard. Mahoning. Hartley. Sharon. Tener. Monroe. Winfield. Morris. Meyers. Donora. |
| | Colraine..... | Canisteo. Holman. Walker. Hill. |

GENERAL LEDGER ACCOUNTING

———**Mine, General Account.**—Representing Inventories of Supplies and Ores, and to balance with Sub-ledger accounts of———mine after all entries for the month are made. To receive all charges pertaining to blank mine, as well as profits on sales and to be credited with all sales and transfers to other accounts.

———**Company, General Account.**—To be credited with Inventories, Accounts Receivable, Cash if any, and other investments made by proprietor company with operating company. This account to have no additional entries made therein except to increase or decrease the amount of such investments and to represent the working capital or investment provided the operating company.

———**Company, Operating Account.**—To represent the operations of mines owned by blank company. To be credited with all profits each month or charged with losses as well as amount expended for New

THE COST OF IRON ORE AT THE FURNACE

| Profit and Loss | |
|---------------------------------------|-------------------|
| Administrative | Earnings |
| Salaries | Operating Expense |
| Printing and Stationery | New Construction |
| Postage | |
| Office Furniture and Fixtures | |
| Office Expense | |
| Telephone and Telegraph | |
| Legal Expense | |
| Rentals | |
| Traveling and Entertainment | |
| Advertising | |
| Outside Agencies and Com- missions | |
| Special Expense | |
| Analysis | |
| Prospecting | |
| Experimental Work | |

| Profit on Sales | Ore at Lower Lake Ports | Freight |
|------------------|-------------------------|--------------|
| Marine Insurance | Ore at Upper Lake Ports | Lake Freight |
| Royalty | Ore at the Mines | Freight |

| Improvements | Surface Expense | Mining Expense |
|-----------------------------------|--------------------------------------|---------------------------------|
| Insurance | Hoisting | Development in Rock |
| Taxes | Stocking and Sorting Ore | Development in Ore |
| Depreciation | Shipping Ore from Pockets | Stopping |
| District Expense | Loading Stockpile, Steam- shovel | Timbering |
| Direct Expense, General office | Loading Stockpile, Hand stripping | Picking and Storing Rock |
| Loss and Gain | R. R. Tracks | Tramming by hand |
| | Breaking and Crushing Ore | Tramming by power |
| | Surveying and Chemistry | Cage and Skip tenders |
| | Office Expense | Pumping |
| | Warehouse | U. G. Tracks |
| | Contributions | Mining Captains |
| | Personal Injuries | Shift Bosses and Time keeper |
| | General Surface Misc. | Dry and Change Houses |
| | Grading Highways | Mine Exploration |
| | | General U. G. Expense |
| | | Rock Filling |
| | | Steam Shovel |

Note.—This chart represents the cost from underground mines. Debit accounts are in *Italics*, items appearing below them are either *abacounts* or direct charges to the account.

NOTE.—This chart represents the cost from underground mines. Debit accounts are in italics, items appearing below them are either subaccounts or direct charges to the account.

———**Mine, Profit and Loss.**—To represent profits or losses of blank mine for the month and balance transferred each month to operating accounts. This account carried on books to show earnings of each mine by itself and for quick reference.

————Mine, Profit and Loss

————Company, General Account

Above accounts to be carried for each proprietor company.

SUB-LEDGER ACCOUNTING

| | | |
|-------------------------------------|---|---|
| Mining Supplies..... | } | Inventories. To be represented by and balanced against ——— Mine, General Account, general ledger. |
| Ore at Mines..... | | |
| Ore at Upper Ports..... | | |
| Ore at Lower Ports..... | | |
| Mining Labor..... | } | To represent cost of and be closed off to "Ore at Mines." |
| Mining Supplies Used..... | | |
| Direct Expense, General Office..... | | |
| Misc. Profit and Loss..... | | |
| Insurance..... | | |
| Depreciation..... | | |
| Royalty..... | | To be closed off to "Ore at Upper Ports" crediting fee owners royalty, sub-ledger, and Royalty account general ledger. |
| Lake Freight..... | } | To be closed off to "Ore at Lower Ports." |
| Rail Freight..... | | |
| Marine Insurance..... | | |
| Taxes..... | } | Administrative expenses, to be closed off to ——— mine, Profit and Loss account, and shown on cost sheet as memo. only. |
| Interest and Discount..... | | |
| General Expense..... | | |
| Improvements..... | | |
| New Construction..... | | To be closed off to General New Construction or operating account of operated mine. |
| Misc. Income..... | | Represent Rentals, etc., to be closed off to General Ledger accounts or operating account of operated mine. |
| Winter Expense..... | } | Deferred charges. To be closed into district accounts and from them to general accounts, and taken up into costs as provided for. |
| New Shafts..... | | |
| Stripping and Development... | | |

Accounts Receivable.—It being necessary to a greater or less extent to sell supplies and personal labor, or perform shop labor for outside interests, which is chargeable to accounts receivable, on the General Books, and these charges originating from supplies, labor and profits on same, it is desirable that these come to the General Office from one source only. Therefore the mines will transfer their labor and shop profits to supplies each month and make all charges for Accounts Receivable on (form 115) showing such charges in detail as to the names and amounts. This charge will then correspond in amount with the invoice rendered. The smaller items will be charged to mine or District Accounts Receivable and the larger direct to the party invoiced. Any profit there may be either in supplies or labor will require a journal voucher, charging Supplies and crediting Mine Profit and Loss. This means that including operating and other mine supplies the above will cover all disbursements of supplies of whatsoever nature from the warehouse during the month, except as per form 113.

GENERAL COST SHEET

| | |
|--------------------------|--------------|
| Mining Labor..... | } Operating. |
| Mining Supplies..... | |
| General Repairs..... | |
| Direct Expense Mine..... | |

TOTAL MINE COST SHEET.

Direct Expense, General Office
Misc. Profit and Loss
Insurance
Depreciation

TOTAL COST "ORE AT MINES"

Royalty

TOTAL COST "ORE AT UPPER PORTS"

Rail Freight
Lake Freight
Marine Insurance

TOTAL COST "ORE AT LOWER PORTS"

GENERAL OFFICE AND MINE ACCOUNTING

MINE ACCOUNTS—EXPENSE ACCOUNTS

Whenever any of the charges which fall against the expense account noted below pertain to the respective mines of the companies direct, they will be known as *Direct Expense Mine* or *Direct Expense General Office*, according to where the charge originates. When pertaining to

the district or collection of mines in one district, they will be known as *District Expense*. When pertaining to one company, as *General Expense*, and to the mining companies as a whole, *To Company General Expense*, as follows:

Company General Expense.—Expenses pertaining to the companies as a whole, when all mines are equally benefited, such as General Office Rents, Salaries, etc., and will be pro-rated to *General Expense* of the various companies each month on a basis to be determined according to tonnage produced by each, or such other basis as may seem equitable.

General Expense.—Expenses pertaining to one company direct, such as Salaries, Rents, etc., for the benefit of one company to the exclusion of all others as well as proportion of *Company General Expense*, will be treated as Administrative Expense and charged to Profit and Loss, but will, however, be carried as a memo. on the General Office Cost Sheet (pro-rated on a tonnage basis) to show the cost per ton of General Expense, such charge to Profit and Loss being carried through the same accounts in the general office into the Mine Profit and Loss until the end of the year except on mines under operating contracts, when it will be charged each month from Mine Profit and Loss into Operating Account.

District Expense.—Expenses pertaining to a district such as General Superintendent and Clerks salaries, stationery, telegrams, etc., which are paid for the benefit of the district or collection of mines as a whole, such expense to be pro-rated on a tonnage basis and charged to Direct Expense Mine, or General Office, as the case may be according to where the charge originates.

Direct Mine Expense.—Expenses pertaining to a mine direct, such as Superintendent's salary, Rents, etc., paid for the benefit of such mine exclusively, as well as its proportion of District Expense. Direct Expense will be treated as an operating cost and shown on mine cost sheet as "Office Expense." It will be transferred to the General Office on journal voucher of Labor and Supplies (forms 115-6) as part of operating expense and shown on General Office Cost Sheet as Direct Expense Mine.

Direct Expense General Office.—Covering expenditures of same nature as Direct Expense Mine, except that they originate in the General Office and will be treated in same manner except as shown on General Office Cost Sheet as "Direct Expense General Office."

NOTE.—It is desirable to charge expenses as nearly direct as possible, and all expenses should be charged (if applying to one mine directly) to that mine in preference to putting it through the District expense, Direct Expense and General Expense only being used where the expenditures are of a general nature, applying to more than one mine or company.

1. Salaries.—Superintendents and Managers, Officers and Clerks, except telephone and telegraph departments, time-keepers and store-keepers.

2. Printing and Stationery.—Purchased direct or charged from stationery department, including all office supplies, rubber stamps, transfer files, etc., stamped envelopes, and printed postcards (except cost of stamps thereon) which should be charged to No. 3.

3. Postage.—Includes postal cards and stamps on stamped envelopes.

4. Office Furniture and Fixtures.

- A. Furniture, including Desks, Tables, Chairs, Book Cases, filing cabinets, etc.,
- B. Apparatus, including typewriters, calculating machines, check punches, etc.,
- C. Fixtures, including movable partitions, shelving, window shades, etc.,
- D. Repairs, labor and material.

5. Office Expense.—A. Petty office expense, including heat, light, water, ice, janitor, messenger service, etc.,

- B. Directors' fees, and corporate expenses,
- C. Hotel expenses and lunches, excluding those chargeable to No. 9,
- D. Maps, guides, subscriptions, etc.,
- E. Moving, changing and repairing office building and partitions, painting, etc.,
- F. Payments to banks for handling pay checks.

6. Telephone and Telegraph.

- A. Telephone rentals,
- B. Telegraph rentals,
- C. Telegraphers,
- D. Salaries of operators,
- E. Toll service.

7. Legal Expense.

- A. All court expenses, attorney's fees, etc. (except salaries of regularly employed counsel, chargeable to account No. 1,
- B. Registration of deeds, leases, etc.

NOTE.—Above not to include any legal expenses pertaining to personal injury cases; this will be charged to operating.

8. Rentals.

- A. Offices,
- B. Warehouses,
- C. Real estate, including minimum rental of ore properties when same does not apply on future royalty.

9. Traveling and Entertainment.—Includes moving expenses of employees.

10. Advertising.

11. Outside Agencies and Commissions.

- A. Expenses, Cleveland Office,
- B. Expenses, Pittsburg Office,
- C. Commissions on sale of ore.

12. Special Expenses.

- A. Detective service,
- B. Private cars, expense of officers,
- C. Premium on surety bonds,
- D. Special expense not otherwise provided for,
- E. Donations of the general office.

13. Analysis.—Including the cargo analysis at lower lake ports by independent chemists, analysis at upper lake ports to be pro-rated against mines for which analysis are made.

14. Prospecting.—Examination of properties, analysis, etc. (except laboratory expenses), not to include regular mine prospecting, but applying more directly to new properties.

15. Experimental Work.—Including draughting, laboratory and other work of an experimental nature, outside of regular mine practice (Labor and Supplies).

NOTE.—Form 127 has been provided for the purpose of classifying the expense accounts and should be made up promptly and sent to the General Office for the statical department. This form should be made by the parties handling the accounts as follows:

"Company General Expense" for the full amount of such expense.

"General Expense," all except proportion of "Company General Expense."

"Direct Expense Mine," all except proportion of "District Expense."

"Direct Expense General Office," all except proportion of "General" and "District Expense." The total of the reports making the total expense of the companies as a whole. The form should be checked carefully to see that it agrees for both month and season with the cost sheet, and with forms 115-6 for the month.

NEW CONSTRUCTION ACCOUNTS

To this account will be charged the cost of buildings, structures or additions to the company plant, such as new offices, machine shops, blacksmith's shop, power plant, pumping plant, engine houses, shaft house, etc., including all additions to the plant which will increase the value of such plant, and are entirely new.

A separate account will be kept with each item of New Construction.

Nothing to be charged to New Construction account excepting expenditures, which per instructions from the proper authorities, are eventually to be charged to plant account.

As soon as any expenditure to New Construction is authorized the general accounting department is to be notified by a statement detailing the nature of the expenditure and the estimated cost.

The accounting department will give such construction a number and all future correspondence and accounting will refer to it by that number. As soon as such construction is completed and all bills in connection therewith are in, the general office must be notified of its completion.

The mine office will carry such construction on their ledger and make all charges in connection thereto, but such charges are to be no part of operating expenses and will be transferred to the General Office on journal voucher from the pay-roll and stores distribution.

The General Office will carry an account with each New Construction by description and number taking up the charges monthly from the mine vouchers and transferring at completion to New Construction. Upon the completion of such construction the General Office must be furnished with a detailed analysis of same, showing the principal details going into it, at the end of the year transferring all mine New Construction to Plant Account.

Monthly analysis of the account must be furnished the General Office on form 202, Fig. 16.

All charges both labor and supplies against the construction accounts must be made in accordance with the following schedule in order that a proper and comparative cost may be obtained for like buildings or plants.

- | | |
|---|--|
| <p>A. Buildings</p> <ul style="list-style-type: none"> A. Excavation B. Grading and filling C. Foundation D. Superstructure complete except E. Brick veneering F. Metal sheathing G. Lavatories, bath-rooms, light and heating plant H. Furnaces, sidewalks, out-buildings, painting, etc. I. Misc. <p>B. Boiler Plants</p> <ul style="list-style-type: none"> A. Excavation B. Filling and grading C. Foundations D. Boilers and breeching E. Installation including setting and fittings for boiler | <ul style="list-style-type: none"> F. Steam pipe, all steam pipe, valves and fittings in boiler house, and all main steam lines and flanges, separators and traps, connections to surface plant G. Water system, all feed water heaters, feed pumps, pipe, valves, fittings, coverings, hangers and supports. H. Purifiers, piping and connections I. Economizers, installation complete, including flues, dampers, pipe connectors, etc. J. Coal hoists complete, including cages and cars K. Chimney foundations L. Chimneys M. Excavation for chimney foundations N. Misc. |
|---|--|

- | | |
|--|---|
| <p>C. Pumping Plants</p> <ul style="list-style-type: none"> A. Excavation B. Grading and filling C. Foundations D. Pumps E. Condensers F. Pumping engines G. Installation H. Steam piping and air lines, including covering and hangers I. Water columns, including suction pipe and hangers J. Misc. <p>D. Hoisting Plant</p> <ul style="list-style-type: none"> A. Excavation B. Grading and filling C. Foundations for engine D. Engines E. Installation F. Piping and connections G. Hoisting ropes, sheaves, idler stands, etc. H. Cages and skips I. Misc. <p>E. Compressor Plant</p> <ul style="list-style-type: none"> A. Excavation B. Grading and filling C. Foundations D. Compressors E. Intercoolers and receivers F. Installation G. Piping and connections H. Steam lines I. Air lines J. Misc. <p>F. Shops</p> <ul style="list-style-type: none"> A. Foundations for machinery B. Shafting, pulleys and belting C. Machine tools each shop D. Instal machine tools E. Piping and connections F. Misc. <p>G. Shaft Houses</p> <ul style="list-style-type: none"> A. Excavation B. Foundations C. Shaft houses D. Head frame, with timber pocket E. Grizzlies F. Misc. | <p>H. Trestles</p> <ul style="list-style-type: none"> A. Grading B. Coal trestles C. Stockpile trestles D. Railroad trestles E. Piling <p>I. Equipment</p> <ul style="list-style-type: none"> A. Locomotives, electric and steam B. Cars, surface or underground C. Steam shovels D. Cranes E. Misc. <p>J. Electric Light and Haulage Plant</p> <ul style="list-style-type: none"> A. Motive power B. Generator C. Switchboard D. Installation E. Material for line circuit F. Installation for line circuit G. Piping H. Storage batteries I. Excavating J. Grading and filling K. Foundations L. Misc. <p>K. Pipe Lines</p> <ul style="list-style-type: none"> A. Excavation B. Pipe and fitts C. Covers D. Installation E. Concrete foundations F. Misc. <p>L. Railroad Tracks</p> <ul style="list-style-type: none"> A. Grading B. Rails and fastenings C. Ties D. Installation E. Misc. <p>M. Miscellaneous</p> <ul style="list-style-type: none"> A. Electric wiring B. Water tanks C. Crushers D. Air receivers E. Power drills F. Diamond or churn drills G. Altering and remodeling plant equipment. |
|--|---|

Improvements.—To this account will be charged such expenditures as building, remodeling, substitution of new machinery and equipment for worn out or obsolete and kindred outlays for improvement of existing works and foundations. It is quite likely that when improvements as noted are made the new work will undoubtedly be on a larger scale than that supplanted; possibly the cost may exceed that of the original; still it is deemed best in the line of conservatism to care for such improvements through profit and loss. Cases will arise, however, when the improvements may be so extensive or of such nature that in all fairness plant account should have a portion of the expense. In such case it will be proper to distribute a part of the cost. Each improvement should receive special consideration in this particular by the proper officials of the company and expenditures for same cared for on the mine accounts by numbers furnished by the General Office the same as noted above under New Construction.

The expenditures each month will be transferred to the General Office on vouchers showing distribution of supplies and pay-roll.

Each mine must ascertain the probable amounts of improvements contemplated for the current year and during the eight months from April to November, inclusive, send to the General Office monthly a journal voucher for one-eighth of the total. This amount should be adjusted to cover additional requirements as soon as any changes from original estimates are made. The charge will be treated in the General Office in the nature of an Administrative Expense, shown on General Cost Sheet as a memo. only and charged off to profit and loss, through Mine Profit and Loss.

In making up the general balance sheet these two accounts will be stated together,

| | |
|-----------------------|-------|
| Improvement fund, \$ | ..... |
| Amount expended since | ..... |
| Balance. | ..... |

If expenditures exceed the provisional charges to Profit and Loss, therefore, the account will be shown as red ink liability. At the close of the fiscal year the balance as above (whether debit or credit) may be made the subject of special consideration, whether it should be finally closed into Profit and Loss, or carried forward to succeeding years. In connection with these expenditures, detailed monthly reports should be made.

Pertinent to the foregoing it is proper to say that occasions will doubtless arise when outlays are to be made for extensive improvements which in fairness to the operations of the years in which the same are

made only a part of the contemplated outlay should be charged thereto. In such event only so much as the proper officials deem the amount the year ought to bear should be included in the provisional charge for the same.

The idea of handling outlays for improvements in the manner outlined is to take care, during the year, in reasonably equitable proportions, of expenditures which strictly speaking are in the nature of (1) a depreciation charge, in that they restore original property worn out or obsolete, and to cover which no provision for depreciation heretofore has been made, and (2) that they include outlays to strengthen the property, which in accordance with the best rules of business practice, a corporation in order to insure its right to live should provide from its current earnings. Monthly analysis of this account must be forwarded to the General Office on form 202, Fig. 16.

NOTE.—An appropriation blank should be made out for every expenditure, chargeable to either Improvement or New Construction, describing the nature of the proposed work and detailing the estimated cost. That when work contemplated provides for transfers of machinery or plant from other properties, the appropriation blank should show the fact and in addition the amount required to instal same.

This appropriation blank should be signed by the Superintendent or General Manager, one copy being sent to the President and two to the Auditor.

Miscellaneous Profit and Loss.—To this account will be charged or credited, as the case may be, all items of whatsoever nature, originating at the Mine or General Office, which are not directly chargeable to expense accounts, operating or plant accounts, such as receipts from sale of scrap, costs directly chargeable to accidents at the mines, etc., dismantling, handling and reconstructing machinery, etc. In other words, to take care of items not otherwise provided for and to keep accounts provided for on a comparative basis. All expenses of idle mines will be charged to "Mine Profit and Loss," "Winter Expense" if surface mines, which will be charged to Winter Expense and pro-rated against costs during the succeeding season.

NOTE.—No other charges are to be made at the mines to Misc. Profit and Loss unless specially authorized by the General Office, and changes or credits to the account must be fully analyzed on form 202, Fig. 16.

Insurance.—As no underwriter's insurance will be carried by properties (except boiler insurance, which will be handled through supplies and charged out equitably to steam production) it has been decided that we will carry our own insurance under the direction of the "Insurance Department" of the U. S. Steel Co.

The Manager's duties are:

1. After having made a careful examination of the various plants or properties, by himself or through his Inspectors, he will recommend the amount of Insurance that should be carried on the respective plants, etc., and the rate thereon. When the amounts and rates have been determined, they will be submitted to the President of the company interested for approval. If in his opinion any modifications should be made, they can be adjusted by correspondence or otherwise with the Insurance Department. In case of disagreement, the matter may be referred to the Comptroller for final adjustment.

2. The Inspectors of the Insurance Department will periodically make examination of the various plants for the purpose of ascertaining if proper precautions are taken against fire, and it will be the duty of the manager of the Insurance Department upon receipt of reports from his Inspectors, that proper precautions against fire are not taken, to immediately notify the President of the constituent company interested, making such suggestions for protection or otherwise as may seem in his opinion advisable. The carrying out of the suggestions will be within the discretion of the President of the constituent company interested.

In case of loss by fire the mines should immediately notify the President's office and the Auditor's office so that proper steps may be taken to have the Insurance Department investigate and report on such loss.

The plan as approved for the creation of the Insurance Fund and the disposing thereof is as follows:

After the amount of Insurance to be carried and the rates thereon have been established, as provided above, each company will distribute monthly one-eighth of the amount of premium during the months of April to November inclusive, to its costs of operations, crediting such amount to the "Fire Insurance" Fund. Quarterly each company will remit to the Treasurer of the U. S. Steel Co. in cash the amount of the Insurance Fund so set up for that quarter. The U. S. Steel Co. will credit each company with its contribution and invest the amount so received for the benefit of the fund, allowing each company semi-annually or annually credit for its proportion of the interest or dividends received on the fund, such interest or dividends, however, to be reinvested by the U. S. Steel Co. for the benefit of the fund.

In case of loss by fire, the company sustaining the loss will call upon the U. S. Steel Co. for reimbursement out of the fund; the difference will be charged to Profit and Loss of such company.

This plan is intended to cover Marine Insurance on vessels of the constituent companies, Marine and Fire Insurance on merchandise in transit, and insurance on merchandise stored in outside warehouses.

It will be noted that this plan practically makes each company its own insurer.

Marine Insurance.—As no marine insurance will hereafter be carried with underwriters a provision must be made by charging, "Ore at Lake Erie Ports" and crediting "Marine Insurance" Fund with 1/2 cent per ton (or such other amount as may hereafter be decided upon), for every ton of ore shipped via lakes, based on vessel weights.

Taxes.—The mine office will send on the first of each month from April to November, inclusive, to the General Office, a journal voucher charging Taxes and crediting Taxes Payable, with one-eighth of previous year's taxes paid, if no better information is to be had, and such amount

shown on mine cost sheet. As soon as assessments and rate of tax for current year can be obtained, this account must be adjusted to date by raising the amount to meet new conditions, or lowering it as the case may be.

NOTE.—Insurance and Taxes, except Marine Insurance, will be reported to the General Office for each month from April to November inclusive, such amounts being shown on the mine cost sheets as a memo. only, and taken up in the General Office Cost Sheet under their proper heading, Insurance to Cost of Ore, and Taxes to Administrative Expenses.

Depreciation.—In accordance with the best rules of business practice, a mining company, in order to insure its right to live should provide from its current earnings, a fund sufficient to cover all cost of property by the time its ore reserve is depleted. It is therefore necessary that depreciation be provided for all idle properties, which depreciation should be large enough (based on the best information obtainable for its ore reserve) to cover the total cost of property, including Improvements. The Mine Office should be kept in touch at all times with the General Office on this subject, advising promptly if any changes in conditions affecting ore reserves, which might cause them to increase or decrease the amount of depreciation. Such depreciation to be charged to Cost of Ore and credited to Sinking Fund or Development as the case may be.

Deferred Charges to Operations.—In order to keep costs at the mines on a comparative basis, it is necessary to defer certain charges and prorate them over the season, and in some cases a term of years. Expenditures of this nature will be transferred to the General Office and remain on the general books as an asset until closed off as depreciation or otherwise. Certain open-pit mines have expenses accumulating during the winter while not producing. These expenditures will be transferred to the General Office monthly, account "Winter Expense." As soon as navigation opens and production commences, such expense must be closed off in equal monthly amounts during the open season to operating costs. The mine making journal voucher charging "Ore at Mines" and crediting "Winter Expense" (Supplies and Pay-roll separately) and take such items into their current Mine Cost Sheet in detail.

Some mines have charges against "Stripping and Development," which expenditure should be transferred to the General Office monthly.

All mines will have charges account "New Shafts," such as Sinking or Raising, and Timbering New Shafts, or lowering old shafts for the further development of ore body. Such expenditures should be transferred monthly to the General Office.

The two latter accounts will be handled in the General Office by depreciation on such basis as will close off the charges before the ore body is depleted.

INVENTORY ACCOUNTS

Mining Supplies.—All purchases or bills of whatsoever nature (excepting insurance and taxes) will be charges to mining supplies account, including freight, Freight Record, form 5, Fig. 1.

All charges to supplies must pass through the storehouse ledger, and be entered under one of the following headings or its sub-division (as many sub-divisions of accounts may be opened as is found necessary for properly keeping track of the stores), allowing the storekeeper to inventory them and check up at any and all times.

A report of all supplies charged will be forwarded to the General Office at the end of each month, showing each invoice, from whom purchased and amount of purchase, Fig. 2, form 236.

SUPPLY ACCOUNTS

FIG. 1.—FORM 5.

| | |
|-------------------------|--------------------------|
| Explosives | Power Drill Castings |
| Candles | Wire Rope |
| Oils | Carbons |
| Drill Steel | Manilla Rope |
| Lumber | Chemicals |
| Mining Timber | Fuel |
| Tools | Forage |
| Steam Packing and Waste | Electric Supplies |
| Pipe and Fittings | Bolts, Nuts and Washers |
| Steam and Water Hose | Car and Locomotive Parts |
| Air Drill Hose | Steam Shovel Parts |
| Rails | Stationery and Printing |
| Iron Castings | Misc. |

Absolutely no stores of any description will be issued from the store-house without a written order signed by the superintendent, or parties authorized by him, showing for what account the stores are to be issued, and the ticket shall be accepted as a receipt from the party ordering the supplies except in case of contractors, when receipt shall be taken from party to whom supplies are delivered. This ticket will be the store-keeper's authority for making his charges against the proper account. These tickets must be entered up daily in the summary book, and at the end of the month must be summarized and charged to the proper operating or

[illegible]

other account and credited to their proper account in the store-house ledger.

Supplies Consumed.—Form 115, Fig. 14, must cover the total amount of mining supplies consumed or taken out of the storehouse, during the month, except amounts shown on form 113, Fig. 12, pay-roll collections, such supplies being charged to operating, New Construction, Improvements, Accounts Receivable, Cash Sales, or other mine supply accounts. The summary of supplies consumed for the month, form 2, Fig. 10, furnished by the supply clerk, should include every item of supplies distributed during the month, the same being divided into three divisions.

1. Supplies charged to Operating and Construction.
2. Supplies charged to Other Mines.

3. Supplies Sold, which are charged to cash sales, or to Accounts Receivable, as the case may be, a detail of such Accounts Receivable being attached to the journal voucher.

Stores used during the month must be transferred to the General Office by journal voucher (form 115, Fig. 14), showing for what they were used.

Supplies Manufactured.—In manufacturing Tram cars, Skips, Cages, etc., all labor and supplies used in the manufacture of such articles will be charged to supplies, until such articles or series of articles are completed, in order to make one charge to operation or construction when used.

Supplies, Profit and Loss.—As mining supplies cannot come out exactly at the end of the year, it is necessary to charge a small percentage on the stores used during the year to cover leakage, etc., although great care should be used so as not to show any great difference between the book value and the inventory value of this account. Of the two, however, between a loss or gain it should show a small gain. In order to keep the book value of supplies on a par with the actual value, the storekeeper should take inventory of different classifications as often as possible and compare quantities on hand with book quantities, correcting his book quantities to agree with actual inventories and correcting average prices to take care of any discrepancies which he may discover.

Supplies Purchased.—Form 236, Fig. 2. This Statement should cover all purchases of whatsoever nature going into the supply account. The statement on the back should be filled out showing the balance on hand the first of the month, plus purchases for the month as shown on front of the sheet and credited with the three divisions mentioned above, and showing the balance on hand. This statement should agree absolutely with the charges on supply ledger, form 6, Fig. 3, and the three items should agree with the summary of supplies as outlined above.

"Ore at Mines."—Representing cost of producing "Ore at Mines"

made up from ledger charges for mining labor and supplies (Operating Expense), Direct Expense, Depreciation, Insurance and Profit and Loss.

Ore at Upper Ports.—Representing cost of ore shipped to Upper Ports at average cost of Ore at Mines, plus Royalty, plus Rail freight to F. O. B. Upper Port deliveries.

Ore at Lower Ports.—Representing cost of ore shipped to Lower

[illegible]

FIG. 2.—FORM 236.

Ports at average cost of Ore at Upper Ports, plus Rail freight to Upper Ports, plus Lake freights, plus Marine Insurance.

NOTE.—Ore at Mines will be credited and Upper Ports charged with all ore shipped from mines, including ore wrecked in transit or sold F. O. B. Mine. Ore at Upper Ports will be charged with all ore shipped from mine without regard as to receipts at dock (for royalty purposes).

[illegible]

FIG. 3.—FORM 6.

and will be credited with all shipments from dock, as well as ore wrecked in transit and sales either F. O. B. Mine or dock. It will also be charged or credited with profit and loss, as the case may be, on all sales of ore at mines or Upper Ports.

Ore at Lower Ports will be charged with all ore received from Upper Ports, at average price at Upper Ports, plus Transportation charges, Marine Insurance and Shrinkage (although carried at vessel tonnage

until overrun or shortage develops), and to be credited with all sales from Lower Ports at selling value. The difference or profit and loss on sales, debited or credited to this account, as the case may be, to maintain the average cost of ore.

Pay-rolls.—The Pay-rolls at the mines should show each employee, by number, name, and occupation, whether contract or company account rate and amount of wages, deduction if any, balance due employees and separately, amounts due outsiders on account of orders and deductions from employees' wages.

The total amount of these orders and balance due employee making the total amount of the monthly Pay-roll.

As soon as the Pay-roll is made out, a voucher (form 116, Fig. 13) must be sent to the General Office, showing the various accounts and to what chargeable, such as:

| | |
|-----------------------|--|
| Direct Expense..... | |
| Operating..... | |
| General Repairs..... | |
| Total Operating..... | |
| New Construction..... | |
| Improvements..... | |
| etc., etc. | |
| Total Pay-roll..... | |

The total making the full credit to Pay-roll, plus any credits for sundry items collected from sales and otherwise. Accounts Payable voucher

| OLIVER IRON MINING COMPANY | | | | | | | |
|-------------------------------|-----------|-------|--------|---------------------------|-----------|-------|--------|
| STATEMENT OF PAY ROLL CHECKS. | | | | | | | |
| MINE. | | | | PAY ROLL OF _____ 1 _____ | | | |
| Date | Check No. | PAYEE | Amount | Date | Check No. | PAYEE | Amount |
| | 01 | | | | 51 | | |
| | 02 | | | | 52 | | |
| | 03 | | | | 53 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | 49 | | | | 99 | | |
| | 00 | | | | 00 | | |
| | Forward, | | | | Forward, | | |

FIG. 4.—FORM 100.

must be made out showing the total amount of the Pay-roll less sundry credits representing collections on Pay-roll, and net amount required to settle the Pay-roll in cash. This voucher will be sent with check to bank handling the mine account, and check passed to credit of the mine,

subject to check of Mine Superintendent or Cashier, less advances made during the month.

A list must be kept of all checks (form 100, Fig. 4) and forwarded to the General Office each month as issued, showing the number of check and amount, spoiled checks being returned to the General Office with such list. All uncalled-for checks at the end of 60 days must be returned to the General Office, where the amount will be placed to the credit of Unclaimed Pay-roll Account, and a record kept of the number, name, month and amount of each. In case check is called for later, it must be paid and charged on petty cash voucher, and the General Office so notified to enable them to correct their record of unclaimed money. Unclaimed Wage account will be closed off to Profit and Loss account every six months, for wages over one year old.

Statistics.—Pay-roll statistics will be sent to the General Office as promptly as possible after the first of the month showing the following information:

"Total amount of Pay-roll" covering the full amount of the regular mine Pay-roll, as well as proportion of District Office Pay-roll chargeable to the mine.

"Total number of days worked," should cover the full number of days shown on the mine Pay-roll, as well as proportion of days in District Office Pay-roll.

"Total number of names on roll," covering every name on the Pay-roll without duplication as well as arbitrary proportion of names in District Office Pay-roll.

"Average number of men....days each." The average number of men will be obtained by dividing the total number of days worked by the number of working days in the month. The working days in the month will be the full number of days in the month except Sundays and legal holidays, being New Year's Day, Decoration Day, July Fourth, Labor Day, Thanksgiving Day, Christmas and regular state and national election days.

"Average rate per day, Company account." The rate is obtained by dividing the total number of days worked company account into the total amount of Pay-roll Company account, including proportion of District Office Pay-roll.

"Average rate per day, Contract account." This rate is obtained by dividing the total number of days worked Contract account into the total amount of Pay-roll Contract account. This Contract account should be divided into three divisions, Miners, Trammers, and Others.

"Average rate per day all labor." This rate is obtained by dividing the total number of days worked into the total amount of Pay-roll including proportion of District Office Pay-roll.

"Average rate per month." This rate is obtained by dividing the total amount of Pay-roll by the average number of men working full time. The result can be checked very closely by multiplying the average rate per day all labor, by the number of days worked full time by each man during the month.

"Production During the Month." This figure is taken from form 150.

"Tons per man per day." This figure is obtained by dividing the production for the month by the total number of days worked, including proportion of District Pay-roll.

NOTE.—In all cases the figures shown as Pay-roll Statistics should be the same as figures shown on Labor Statement, as should the average figures on the cost sheet for rate per day, etc., be the same as shown on Pay-roll Statistics.

For our outside explorations, one form may be used except where we are working some large important property that may soon develop into a mine. In such cases as the latter use a separate form for each.

RECEIPTS AND DISBURSEMENTS

Receipts.—No receipts of the following nature should be treated as any part of mining costs, but transferred to the General Office as receipts or income if received at mine office.

Interest on Investments.

Interest on Bills Receivable and Accounts.

Rentals received from detached property, such as lots, miners, dwellings or machinery.

Special general receipts.

Cash Discount on purchases.

Disbursements.—No disbursements of the following nature should be treated as part of mining costs, but should be transferred to the General Office if originating at the mines.

Interest on Bonded or Mortgage debt.

Interests on Loans and Bills Payable.

Interest and Discount.

Taxes.

General, Administrative and Selling expense.

NOTE.—In the General Office, all items above mentioned are Profit and Loss items, and will be shown on general balance sheet under that heading, in addition showing on General Office Cost Sheet as memo.

PRODUCTION AND SHIPMENTS

Daily.—A daily report will be sent to the General Office showing the Number of Men Employed (classified), Tons of Ore Produced, Shipments

from Mines and Docks, and Changes in Stockpile, also analysis as requested.

This report must show the estimated production and shipments each day, the overrun and shortages taken up each day, as fast as actual weights are received. Notation to be made on adjusted daily report for month, in footnote, showing difference between shipments, as shown on this report and form 150. The difference is always caused by cars in transit.

Monthly.—This report must show the actual amount of ore produced during the month, which should be based on actual shipments from pockets (actual R. R. weights) plus estimated pocket shipments in transit at end of the month, plus estimated tonnage stocked during the month, less estimated ore in transit (from pockets) at end of previous month, as follows:

| | |
|---|------|
| January Production | Tons |
| Actual R. R. weights..... | |
| Estimated ore in transit..... | |
| Estimated ore stocked..... | |
| Production for January..... | |
| February Production | Tons |
| Actual R. R. weights returned..... | |
| Estimated ore in transit..... | |
| Estimated ore stocked..... | |
| Less estimated ore in transit previous month... | |
| Production for February..... | |

Any overrun in cleaning up stockpile should be treated as production for season only, on cost sheet.

On this report it will be shown in column, "Stockpile overrun month," during the month in which overrun develops, being footed with "Current month" and "Previous month" and working total since January 1.

On succeeding months since January 1, becomes "Previous months" this leaving blank "Stockpile Overrun Month" except for overrun which may develop in that month. In other words, "Stockpile Overrun Month" will show only the overrun developing during the current month. This form should be made up showing the following:

* Each mine by grades separately, making total of each mine and grade, total of each group of mines, each total and grand total proving itself as follows.

"Current months plus previous months and stockpile overrun month

(in current month as above), should equal total since January 1, plus on hand January 1, should equal "Total Produced and in Stock," less "Total Mine Shipments" should equal "Balance in Stock." Overrun Stockpile for season is a memo. and proves with nothing except your stockpile ledger. It should show at all times the accumulative overruns and shortage for the season. (Shortage showing in red ink.) The Dock Statement should show the amount in docks January 1, plus seasons accumulative shipments to docks, making total, and less accumulative shipments from docks, leaving balance in docks, which should check with R. R. company's dock report. Tonnage shown in this report should be the same in Mine Cost Sheets in order to agree with General Office Cost Sheet made from these figures.

Shipments.—As shown on form 150 should be actual shipments as shown by the R. R. company on their statements for the month. No other figures for shipments should go on the report. They should agree with the Royalty Statement furnished. "Balance in Stock" at the end of each month should be the difference between "Total Produced and in Stock" for the season, less shipments for the season. This should be checked with the Stockpile Ledger, the difference between this report and the Stockpile Ledger being the amount in transit.

Form 150 is intended for the auditor's office only. Shipments by vessel should show bill of lading and railway weight. This report should also show, as stated above, the ore lost in transit and the all-rail shipments. The total of this report should be checked by deducting 1 per cent. of the railroad weights to see that it approximates out the total of the amount as shown by the vessel weights. If there is a large difference, the weights should be checked over to see if there has been a mistake made.

Overruns and Shortages.—As weights reported each day would be based on estimates, it will be necessary to correct such estimates at the earliest opportunity.

Reports from railroads during shipping season of actual weights should be received within two days from date of shipment. Any difference between estimates and actual weights should be added or subtracted, as the case may be, to the estimates for the next day on Production, Dock account, Shipment from mines, and Stockpile, if affected.

When stockpiling ore the greatest care should be taken in making estimate of production, and a record must be kept of each stockpile separately, charging the pile with the estimated ore put into it, and crediting it with the actual shipments made from it. As each stockpile is cleaned up the overrun or shortage which develops on the pile must go on form 150, and on cost sheets in the seasons column, for the month in which the stockpile is cleaned up, and the overrun or shortage. A large

overrun or shortage, if thrown into the monthly cost, would make it out of proportion with other months.

Largely underestimating or overestimating amounts of ore which go into stockpiles, so that a large percentage of overrun or shortage is developed, will be considered a reflection on the watchfulness of the superintendent. In case we should develop a shortage, and it is hard to say just how much leeway should be allowed, and what percentage of overrun would be right. In any event it should not exceed 5 per cent., and if it could be brought to one-half that per cent. the cost for each month through the year would be on a better basis, and would be more nearly correct. If an overrun develops on a certain pile, it must be shown as overrun on that pile. The same if a shortage develops. In no case must the overrun from one pile be used to cover shortage in another pile, or any part of it be taken to increase the current month's production. Neither must any part of the production during the month at any time be used to cover up any shortage which may develop on any stockpile. In all cases the production and shipments, overruns and shortages must be correctly shown.

Transfer of Supplies, Labor Charges, Etc.—All transfers of mining supplies, shop labor, etc., must be reported to the General Office on form 115-6, Figs. 13 and 14, as the case may be, sending original invoice only to the receiving mine, who will take same up in the supply account in the same month in which it is rendered without regard to receipt of goods or correctness of billing. If goods do not arrive as invoiced or invoice is not correctly rendered, such corrections or shortages will be re-invoiced to the shipping mine in the succeeding month. Any controversy as to prices or adjustments will be referred to the auditor for settlement.

It will not be necessary to send copies of such invoices to the General Office unless a controversy arises, but will be sufficient for the shipping mine to show same against each mine on their distribution vouchers and the receiving mine to enter same on record of supplies purchased.

Transfer of Plant.—All transfers of plant property, such as buildings, machinery, etc., should be reported to the General Office on triplicate invoices without values sending the original and duplicate invoices to the receiving mine, who will approve and report same in the usual manner.

Values of plant transfers will be fixed by the mechanical engineer, and entries made on the general books only to cover such transfers. Memo. entries should be made on the mine books of all transfers, both from and to other mines, and at the end of the month a statement made of the shipments and receipts during that month to the General Office.

This statement to cover merely the plant transferred and to what mine it was shipped or from what mine it was received.

No machinery or supplies will be loaned to another mine, but proper transfer made of all equipment or plant transferred, except in case of machinery rental, such as steam shovels, diamond drills, etc. No machinery should be carried in plant account that is located at another mine or exploration but proper transfer made to such mine or exploration on the general books.

As a general proposition, machinery transferred to another mine is worth no more to the receiving mine on account of such transfer, therefore no expense should be added to the value of such plant by reason of such transfer. Hereafter the shipping mine will stand the expense of dismantling property loading and placing F. O. B. cars, the machinery or property transferred, charging such expenses to mine Profit and Loss.

The receiving mine will stand all expenses from this point, such as freight, unloading and handling charges, and installation, charging same to Improvements. If, however, in connection with installing this plant there is any large improvement intended, which will materially increase the value of the plant transferred, it should be taken up with the General Office and a special ruling made in such cases.

The shipping mine shall word their invoices giving description, etc., of all machinery shipped, using the exact words and numbers as shown on inventory of Dec. 31 last, and the receiving mine shall enter on their inventory the exact description as shown on the invoice.

Machinery Rentals.—This is a matter that should be discouraged as much as possible. In case of steam shovels when some of the mines would have use for their shovels only a small part of the year, and other mines have at times idle shovels, also in case of diamond drill outfits, when they desire to use them only temporarily, it becomes necessary to take care of these items in the way of a rental from one mine to another. This rental should be handled practically on the basis of cost. In other words, a greater rental should not be charged for the use of the steam shovel or diamond drill outfit than the necessary wear and tear on machinery, and the cost of putting the machinery into its original condition. All income from machinery rental should be transferred to the General Office, therefore it would be proper that any expense of the proprietor mine to whose plant the machinery is charged, to charge against this machinery rental, the cost of any repairs necessary to put the machine back into its original condition when it left the mine.

It might be well to state further that the plant account of the various mines belongs to the company as a whole, that they are given to one mine without charge for the purpose of getting out ore, and such mines taking up in the cost of operating only the necessary charges of keeping

such plant in repair. Therefore it is not a good accounting proposition for the General Office to charge a profit on the machinery used at another mine in order to take up a corresponding loss on the same transaction.

The same would also apply to Tenement rentals, the income occurring therefrom being transferred to the General Office. Therefore repairs necessary on such tenements, and the insurance necessary to keep them protected should be charged against the same account. There should not, however, be a loss to the General Office on the income account, and should any loss develop, at the end of the year it will be taken out of the Rental account and transferred to Misc. Profit and Loss of the mine owning the buildings or machinery.

MINE ACCOUNTS—MINE BOOKS (UNDERGROUND MINES)

| General ledger Controlling accounts | Sub-accounts | Distributing accounts |
|---|--|---|
| General Office | 101. Explosives 102. Candles 103. Oils 104. Drill steel | A. Steam production B. Electric power |
| Inventory | 105. Lumber 106. Mining timber 107. Tools | C. Shop { Machine shop Carpenter shop Smith shop expense |
| Bank | 108. Steam packing and waste 109. Pipe and fittings 110. Steam and water hose 111. Air drill hose 112. Steel rails 113. Iron Castings | D. Compressor and drills E. Teaming F. Repairs |
| Supplies..... | 114. Power drill castings 115. Wire rope 116. Carbons 117. Manilla rope 118. Chemicals 119. Fuel 120. Forage | G. Laboratory |
| Petty Cash | 121. Electric supplies 122. Bolts, nuts and washers 123. Car and locomotive parts 124. Steam shovel parts | |
| Loss and Gain | 125. Stationery and printing 126. Misc. | |
| Taxes | | |

MINE ACCOUNTS—MINE BOOKS (UNDERGROUND MINES)

| General ledger Controlling accounts | Sub-accounts | Distributing accounts |
|---|--|---|
| Insurance | 200. Development in rock 201. Development in ore 202. Stopping 203. Timbering | |
| Rents | 204. Picking and storing rock 205. Trammig by hand 206. Trammig by power | |
| District Expense | 207. Cage and skip tenders 208. Pumping 209. U. G. tracks 210. Mining captains 211. Shift bosses and timekeepers 212. Dry and change houses 213. Mine exploration 214. General U. G. expense 215. Rock filling 216. Steam shovel | |
| Mining Expense..... | 225. Hoisting 226. Stocking and sorting ore 227. Shipping ore from pockets 228. Loading stockpile, steam shovel 229. Loading stockpile hand 230. Stripping 231. R. R. tracks 232. Breaking and crushing ore 233. Surveying and chemistry 234. Office expense 235. Warehouse 236. Contributions 237. Personal injuries 238. General surface 239. Misc. 240. Grading highways | |
| Surface Expense..... | | |
| New Construc- tion | | A separate account for each building and equipment of each plant. See details on page 10. |
| Improvements | | A separate account with each job. See details, page 12. |
| Accounts Receivable | | |

[illegible]

FIG. 6.—FORM 102.

The full cost of electricity, carbons, etc., to be apportioned against the various accounts for which it is used in the proportion of electricity consumed by them. Electric lights to be charged against the account benefited, such as Office, Hoisting, Steam plant, etc.

C. Shop Expense.—Labor only, except as herein-after mentioned. All labor at Machine, Smith and Carpenter shops and Master Mechanic's time will be charged to shop expense, a close record being kept of time expended for and against the various accounts in the distribution of shop expense at the end of the month.

All the material used in the shops for the various operating accounts must be reported to the storekeeper daily, who will charge them direct from stores, except general items, such as Steam, Electricity, Coal, Borax, etc, which will be apportioned against the various accounts, pro-rated on a basis of labor performed.

D. Compressor and Air Drills.—Labor and supplies, including proportion of engineer's time used in running compressor, repairs to machinery and buildings, oils, waste, etc., pipe lines and repairs to same, hose and pipe for replacement, proportion of steam consumed, or other power used.

The full cost of running compressor for the month will be apportioned against the various accounts for which it is used, such as Pumping, Development in Rock or Ore, Stopping, etc., on a basis of labor performed at drilling under the above heads, and when for outside purposes, such as Pumping, or Hoisting, a proportion based on steam cost for same work, plus an extra charge on account of an increased cost of air over steam.

E. Teaming.—To this account should be charged the cost of stables, teams, teamsters, etc., for the month (except the cost of keeping mules for tramping purposes underground, which is chargeable to accounts 200-1-6). A close record must be kept during the month of work done for the different cost accounts and the same subdivided on an equitable basis against the various accounts for which the work was done.

F. Repairs.—All repairs are chargeable direct to cost accounts affected, such as repairs to skips, to cars, to Hoisting, etc., but for the purpose of showing on General Office Cost Sheet the amount expended for repairs and maintenance, all repairs must be separated on vouchers of supplies and labor from operating when sent to the General Office.

G. Laboratory.—To this account should be charged all supplies used or labor performed during the month in making analysis, in fact all cost in connection with running the laboratory.

The full cost of analysis made during the month should be ascertained from the number of analysis made, and that rate used in charging out to operation, or other mines or parties, to balance the account except as noted below.

NOTE.—All operating accounts including shop expense, laboratory, teaming, etc., should be handled on a cost basis and only the cost of such work charged to operation, or any of our other mines. In the case of work done for outsiders, a profit (to be determined by the management) should be added to this cost and such profit transferred to the General Office as a credit to Mine Profit and Loss.

MINING EXPENSE ACCOUNTS—UNDERGROUND MINES

200. Development in Rock.—Labor and supplies, including cost of miners, drillers, loading tram cars, and material used in drifting and cross-cutting, sinking or raising in rock, as well as its proportion of Compressor and Air Drill cost as shown consumed for that purpose.

201. Development In Ore.—Labor and supplies, including cost of miners, drillers, loading tram cars, and material used in driving main drifts raises or winzes in ore, as well as its proportion of Compressor and Air Drill cost as shown consumed for that purpose.

NOTE.—The above account not to include the cost of sinking or raising shafts, which will be charged to Sinking Shafts, and be treated in the General Office as deferred charges to be closed by depreciation.

Show the Number of Feet on Labor Statement of Drifting, Cross-cutting, Sinking or Raising shafts, Raises, Winzes, in ore and in rock separately.

202. Stopping.—Labor and supplies, including cost of mining, drilling, blasting and breaking down the ore body (except as per account 201) as well as wheeling ore to chutes and all shoveling in connection with same, and its proportion of Compressor and Air Drill cost as shown consumed for the purpose.

NOTE.—Stopping to include all mining on sub-levels except main raises and winzes from main levels.

203. Timbering.—Labor and supplies, including cost of all timbering in main openings, raises, and stopping work, as well as proportion of the miners labor on timbering to be charged to this account, and extraordinary repairs to shafts; ordinary repairs to shafts must be charged to Hoisting expense.

204. Picking and Storing Rock.—Labor and supplies, including all cost of picking and storing rock underground.

205. Tramming by Hand.—Labor and supplies, including all cost of tramming, shoveling, and taking ore from chutes on main levels or such sub-levels as cannot be reached by main level openings.

206. Tramming by Power.—Labor and power, including all cost of tramming, shoveling, and taking ore from chutes or main levels or such sub-levels as cannot be reached by main level openings, cost of keeping

live stock, mule drivers and when used, the proportion of electricity used for that purpose.

207. Cage and Skip Tenders.—Labor only, including checkers and bell ringers.

208. Pumping.—Labor and supplies, including pumpmen, pipemen, repairs and proportion of steam production used for pumping.

209. U. G. Tracks.—Labor and supplies and repairs on U. G. tracks, except original cost of steel rails (new) to be charged to New Construction; when used for replacement to be charged to this account.

210. Mining Captains.—Labor only.

211. Shift Bosses and Timekeepers.—Labor only.

212. Dry and Change Houses.—Labor and supplies, including all cost of running change houses, as well as steam used for heating purposes, repairs to building, etc.

213. Mine Exploration.—Labor and supplies including prospecting and diamond drilling.

214. General U. G. Expense.—Labor and supplies, including cost of ditches and other misc. items for which no provisions are made in above accounts.

215. Rock Filling.—Labor and supplies, including all cost of loading rock on surface by hand or steam shovel, tramming or switching it to the shaft, lowering it into the mine, tramming and storing it underground. This applies only to rock taken into the mine from surface and does not cover any expense of picking and storing rock underground.

216. Steam Shovel.—(Stopping in Pits.) Labor and supplies, including all cost of loading ore by steam shovel in open pits.

SURFACE EXPENSE ACCOUNTS—UNDERGROUND MINES

225. Hoisting Expense.—Labor and supplies, including engineers (except proportion charged to electric plant, shops, compressors, etc.), as well as all oils, waste, light, brakemen and helpers, proportion of steam power, or electricity used for hoisting, repairs to skips, shafts, replacements of hoisting ropes, and ordinary repairs to shaft house.

226. Stocking and Sorting Ore.—Labor and supplies, including landing, dumping and tramming ore and rock on stockpile and preparation of stockpile bottoms and trestles.

227. Shipping Ore From Pockets.—Labor and supplies, including cost of tramming rock on surface during shipping season.

228. Loading Stockpile, Steam Shovel.—Labor and supplies, shipping stockpile, including cost of operating steam shovel, crew's wages, etc.

229. Loading Stockpile by Hand.—Labor and supplies, including cost of shipping stockpile when loaded by hand.

230. Stripping.—Labor and supplies, including drilling and blasting of surface, teams hauling dirt and all expense in connection with stripping open pit operations.

231. Railroad Tracks.—Labor and supplies, including cost of constructing surface railways, switches, etc., of broad gauge pattern, as well as all repairs to same, except new rails.

232. Breaking and Crushing Ore.—Labor and supplies, including all cost of reducing lump ore to required size, by hand or power.

233. Surveying and Chemistry.—Including all cost of engineering department, running laboratory, chemicals, etc. (except work done for outside parties or our other mines having no laboratory or engineer of its own).

234. Office Expense.—Labor and supplies, including all cost of running the office at the mines, as classified in General and District Expense.

235. Warehouse.—Labor and supplies, including salary of storekeeper and whatever supplies are consumed during the month to operate same.

236. Contributions.—Labor and supplies, to include contributions of whatever nature made at the mine, as authorized by the General Office.

237. Personal Injuries.—Including donations or whatever voluntary contributions, judgments or forced settlements, salaries and fees of surgeons and attendants, including hospital expenses, medical supplies, etc. Intended to cover all expenses of the mine on account of personal injuries.

238. General Surface Expense.—Labor and supplies, including surface items not otherwise provided for.

239. Miscellaneous.

240. Grading Highways.—Labor and supplies, including all cost of grading public roads, crossing caving territory, ordinary expense of surfacing and grading mine roads is chargeable to account No. 238.

NOTE.—Above cost accounts represent the division of operating expense at the mines and from which the mine cost sheet is made.

Taxes and Insurance will show as a separate item below these on the cost sheet, and will be transferred to the General Office by journal voucher.

The cost of operating for the month is transferred to the General Office, by journal voucher of labor and supplies, and will be the total as shown by the Mine Cost Sheet for Operating Expense. Copy of Mine Cost Sheet must be sent to the General Office as soon as completed.

MINE ACCOUNTS—MINE BOOKS (OPEN PIT MINES)

| General ledger Controlling accounts | Sub-accounts | Distributing accounts |
|---|---|---|
| General Office | 101. Explosives 102. Candles 103. Oils 104. Drill steel 105. Lumber 106. Mining timber 107. Tools 108. Steam packing and waste 109. Pipe and fittings 110. Steam and water hose repairs 111. Air drill hose 112. Steel rails 113. Iron castings 114. Power drill castings 115. Wire rope 116. Carbons 117. Manilla rope 118. Chemicals 119. Fuel 120. Forage 121. Electric supplies 122. Bolts, nuts and washers 123. Car and locomotive parts 124. Steam shovel parts 125. Stationery and printing 126. Misc. | A. Steam production B. Electric power C. Compressor and air drills D. Shop expense { Machine shop Smith shop Carpenter shop E. Teaming F. Repairs G. Laboratory |
| Inventory | | |
| Bank | | |
| Supplies..... | | |
| Petty Cash | | |
| Loss and Gain | | |
| Taxes | | |
| Insurance | 250. Stripping by hand 251. Teaming 252. Mining captains 253. Shift bosses and timekeepers 254. Water supply 255. Lighting 256. Drilling and blasting 257. Track expense 258. Waste pile expense 259. Operating locomotives 260. Repairs to locomotives and cars 261. Operating steam shovels 262. Repairs to steam shovels 263. Office expense 264. Warehouse 265. General stripping expense 266. Contract stripping | |
| Rents | | |
| District Expense... | | |
| Winter Expense Stripping and Development.. | | |

MINE ACCOUNTS—MINE BOOKS (OPEN PIT MINES)—*Concluded*

| General ledger Controlling accounts | Sub-accounts | Distributing accounts |
|---|--|-----------------------|
| Mining Expense..... | 275. Mining by hand | |
| | 276. Teaming | |
| | 277. Mining captains | |
| | 278. Shift bosses and timekeepers | |
| | 279. Water supply | |
| | 280. Lighting | |
| | 281. Drilling and blasting | |
| | 282. Track expense | |
| | 283. Pumping | |
| | 284. Operating locomotives | |
| | 285. Repairs to locomotives | |
| | 286. Operating steam shovels | |
| | 287. Repairs to steam shovels | |
| | 288. General repairs | |
| | 289. General mining expense | |
| | 290. Surveying and chemistry | |
| | 291. Office expense | |
| | 292. Warehouse | |
| New Construc- tions | 293. Contributions | |
| | 294. Personal injuries | |
| Improvements | 295. Removing rock in ore body | |
| | 296. Stockpile expense | |
| Accounts Receivable | { A separate account for each building and the equipment of each plant. See details page 10. | |
| | { A separate account for each job. See details page 12. | |

MINING EXPENSE ACCOUNTS—OPEN PIT MINES

Winter Expense.—All expenses in connection with open pit mines from the close of navigation to the opening of navigation next year will be charged to Winter Expense.

Such expense will be taken care of in eight monthly amounts by charge to operations of one-eighth of the total amount each month from April to November inclusive. The expense accruing during the

winter will be separated according to the cost sheet and extra items prorated against regular costs in equal monthly amounts.

NOTE.—The above charges apply to mining expense only. The Stripping and Development charges will be handled in the usual manner, by charging the expenditures monthly to Stripping and Development.

STRIPPING AND DEVELOPMENT

250. Stripping by Hand.—Labor and supplies, including wheelers, shovelers, and supplies used in stripping by hand.

251. Teaming.—Labor and supplies, including all costs of teams and labor while at stripping, or work in connection with stripping.

252. Mining Captains.—Labor only, to be divided on a basis of locomotive and steam shovel labor on stripping or in ore, latter to be charged to mining account No. 277.

253. Shift Bosses and Timekeepers.—Labor only, on same subdivision as account No. 277.

254. Water Supply.—Labor and supplies, including cost of pumping plant, pipe lines, and pipemen and water carriers, for water supply of locomotives and steam shovels while on stripping.

255. Lighting.—Labor and supplies, including proportionate cost of dynamo, where electric lights are used, divided on same basis as No. 252.

256. Drilling and Blasting.—Labor and supplies, including drilling, powder gang and explosives while on stripping.

257. Track Expense.—Labor and supplies, including track men, rails, spikes and ties (except cost of permanent track in new mine, to be charged to New Construction), all repairs to permanent or temporary tracks to be charged to No. 257. Tracks in ore to be charged to No. 282.

258. Waste Pile Expense.—Labor and supplies, including trackmen on waste pile trimmers and cost of keeping track in repair on waste pile.

259. Operating Locomotives.—Labor and supplies, including fuel, engineer and firemen, brakemen, and signal men and all cost of running waste trains (except water supply).

260. Repairs Locomotive and Cars.—Labor and supplies, including full cost of repairs on cars, and proportionate cost of repairs on locomotives, as between stripping and ore.

261. Operating Steam Shovels.—Labor and supplies, including engineers, firemen and cranesmen, while on stripping.

262. Repairs. Steam Shovels.—Labor and supplies, while on stripping.

263. Office Expense.—Labor and supplies, including all cost of running the office of the mine, as classified in General and Direct Expense.

264. Warehouse.—Labor and supplies, including salary of store-

keeper and whatever supplies are consumed during the month to operate same.

265. General Stripping Expense.—Labor and supplies, including all surveying and other expenses not otherwise provided for than stripping.

266. Contract Stripping.—Including all cost of stripping paid outsiders on account of contracts.

MINING EXPENSE

275. Mining by Hand.—Labor and supplies, including wheelers, shovelers and miners as well as material used in mining by hand.

276. Teaming.—Labor and supplies, when working in ore or in connection with mines working in ore.

277. Mining Captains.—Labor only, to be divided on basis of locomotives and steam shovels, labor on stripping or in ore. Stripping proportion to be charged to account No. 252.

278. Shift Bosses and Timekeepers.—Labor only, on some division as account No. 277.

279. Water Supply.—Including cost of pumping plant, pipe lines and pipe men and water carriers for water supply of locomotives and steam shovels, while working in ore.

280. Lighting.—Labor and supplies, including proportionate cost of dynamo where electric lighting is used when working in ore.

281. Drilling and Blasting.—Labor and supplies, including drillers, powder gang and explosives while working in ore.

282. Track Expense.—Labor and supplies, including track men, rails, spikes, and ties (except cost of permanent track in new mine to be charged to new construction). All repairs to permanent or temporary tracks to be charged to account No. 282 when laid and used for working in ore. Stripping tracks to be charged to account No. 257.

283. Pumping.—Labor and supplies, including all cost of pumping, when pumping is necessary in wet mines, except as used for accounts 254 and 279.

284. Operating Locomotives.—Labor and supplies, including fuel, engineers and firemen, brakemen and signal men, when working in ore.

285. Repairs to Locomotives.—Labor and supplies on locomotives when working in ore.

286. Operating Steam Shovels.—Labor and supplies, including engineers, firemen and cranesmen when working in ore.

287. Repairs to Steam Shovels.—Labor and supplies, when working in ore.

288. General Repairs.—Labor and supplies, including all repairs to building and machinery not otherwise provided for.

289. General Mining Expense.—Labor and supplies, including car checkers, billers and other expenses not otherwise provided for.

290. Surveying and Chemistry.—Including all cost of engineering department, running laboratory, chemicals, etc. (except work done for outside parties or our other mines, having no laboratory or engineer of their own).

291. Office Expense.—Labor and supplies, including all cost of running the office at the mines, as classified in General and Direct Expense.

292. Warehouse.—Labor and supplies, including salary of supply clerk and whatever supplies are consumed during the month to operate same.

293. Contributions.—Labor and supplies, to include contributions of whatever nature made at the mines as authorized by the General Office.

294. Personal Injuries.—Including donations, or voluntary contributions, judgments, or forced settlements, salaries and fees of surgeons and attendants, including hospital expense, medical supplies, etc. Intended to cover all expenses of the mine on account of personal injuries.

295. Removing Rock in Ore Body.—Labor and supplies, including all cost of loading and handling rock encountered in the ore body, including the cost and time of steam shovel, locomotives and hauling of such rock to waste pile.

NOTE.—No low-grade ore or lean ore to be included in this account.

296. Stockpile Expense.—Labor and supplies, including all cost of stockpile, low-grade or lean ore.

NOTE.—Only the mining expense of Missabe mines will be treated as operating expenses. The stripping cost will be transferred as a separate item in total and treated as an asset in the General Office cost until extinguished, although the cost of stripping will be shown as outlined above on the Mine Cost Sheet.

The cost of operating for the month is transferred to the General Office by journal voucher of labor and supplies and must agree with the Mine Cost Sheet.

MINE OFFICE, ACCOUNTING REPORTS, ACCOUNTS, ETC.

Invoices.—Invoices should be turned over to the supply clerk promptly, and should be checked by him against material received. If material checks out all right he should sign invoice on line designated for that purpose. The invoice should then be checked as to extensions and footings, discount and freight deductions, and should be signed as correct by chief clerk, and marked as to what account number should be charged. All invoices must be charged to mining supplies, and from these the items are taken through the supply book, and charged to the expense account benefited. When the invoices have been approved by

the superintendent or person authorized by him to do so the original will be forwarded to the General Office for payment accompanied by letter listing same. All signatures must be in full, initials only will not be sufficient.

At the end of the month or not later than the eighth of the succeeding month a complete list of all bills forwarded during the month past will be sent to the General Office. This list will show balance of supplies on hand at the first of each month, and amount of supplies purchased during the month, the amount consumed or disbursed during the month and balance on hand at the end of each month.

[illegible]

FIG. 7.—FORM 90.

The duplicates of invoices must be vouchered at the end of each month at each mine. Collect all bills from each firm for the month and make one voucher covering each firm's bills. The office voucher form will be used for this purpose and will credit "General Office" and charge the sundry classes of supplies for amount of invoices, without deductions for cash discounts. These vouchers should be arranged alphabetically for convenience in reference and numbered consecutively, beginning with next consecutive number from last number used during the previous month. Careful attention must be given to cash discount invoices. Such invoices must be forwarded at earliest possible date, and

in cases where material does not reach mine before expiration of discount period, invoices must be approved by superintendent in person, and he must be advised before approval of invoice, that the material has not been received, so that only such invoices will be forwarded for payment before receipt of goods as are deemed advisable by the superintendent.

Journal Entries, Miscellaneous.—Journal entries should be made on "credit vouchers" covering any transactions that may come up during the month, form 90, Fig. 7. Charge "General Office" and credit "Petty Cash," decreasing your Petty Cash for example. Entry should be made charging Petty Cash and crediting sundries, covering cash collections, and charging "General Office" and crediting "Petty Cash," covering remittance of cash collections to General Office.

An entry should be made covering collections on Pay-rolls, when they go to pay a part of the pay-roll, such as collection for supplies, commissions, etc. The entry would then be, debit Pay-roll and credit Supplies, Garnishee and collection fees, etc.

Entries should be made each month closing all accounts into General Office, except Supplies, Petty Cash, and Bank Account. These misc. entries follow the vouchers covering invoices in order of their dates, and the operating vouchers hereafter mentioned may follow the misc. entries. Continue the series of numbers from Office vouchers to Credit vouchers, so that there may be no duplicate numbers on any vouchers for the year. A new series of numbers may be commenced each year.

Record of Transactions.—All vouchers, whether Office vouchers or Credit vouchers, will be numbered numerically in "Record of Trans-

[illegible]

FIG. 8.—FORM 91.

actions," form 91, Fig. 8. All credits to General Office will appear in General Office column. All credits to other accounts will appear in sundry column on the left. All debits to Supplies, Mining Expense, Surface Expense, Stripping and Development, Steam production, Electric power, the different shops, Teaming and Compressor and Drills will appear in columns provided for that purpose. Debits to all other

the railway dock statement. The total footings should be carried forward from month to month, so that at any time the ledger will show total shipments from mines to docks and total shipments from docks to lower ports.

Stockpile Ledger.—An account should be kept with each stockpile in this record, charging it up monthly with mining tally weights put into it, and crediting it with actual weights shipped from each pile. This will show actual overrun or shortage of each pile.

Time Books.—The timekeeper should assign on his time book a page or pages for each class of employees, that is Engineers should all show in the same place on time book. In another place Firemen should be found, Surface men in another, the same plan being carried out with each class of employees. The time shown under these different headings should be classified in detail on lower part of page on which the time is shown. If there is not sufficient room on that page, the classification may be shown on the following page. The timekeeper should in this classification state exactly what the men are doing, such as "digging ditch around caved ground," "unloading timber," "unloading coal," "cleaning up stockpile bottom," etc.

The number of days at each rate in the classification should agree exactly with the number of days at each rate as shown in the time being classified.

Check-roll.—The lines on the book should be numbered consecutively, from number one to the highest number held by any employee on the time book. The names of employees are written opposite their numbers in the Check-roll. The time of each employee is transferred from time book to check-roll, thus collecting it. An employee may appear on several places on the time book, but his time will appear on only one line in the check-roll.

On the Check-roll a different mark should be used to distinguish company account time from contract time. At the end of each month the number of company account days at each rate, and the number of contract days, as extended in their proper columns, thus showing the number of company account days at each rate and total contract for each employee for the month.

The total number of company account days at each rate on the Check-roll should balance with the total number of company account days at each rate in the time book. The total number of contract days on Check-roll should balance with total number of contract days in the time book.

Contract Book.—This book is provided for the purpose of figuring the earnings of each contract and of keeping a permanent record of same. The earnings of each contract employee are transferred from this

book to his account on the Pay-roll. The number of each contract should be shown on this Contract Book, and the name and number of each man working on each contract should be carried into the Contract Book, under their respective contract numbers from time books. This may be done before the end of the month in order to facilitate work at the first of each month.

The number of days worked by each man in the contract, should be placed to his credit in the contract book as soon as they can be determined on time book. The number of cars of ore or rock mined or number of feet raised, sunk or drifted by each contract with rate per car or foot, should be turned in by the Mining Captain and placed to the credit of the contract.

The Warehouse Clerk will report supplies chargeable to each contract. The net earnings of each contract will then be determined by extending cars or feet mined at the different rates and deducting from these gross earnings the supplies and labor cost chargeable to the contract. The net earnings are divided by the number of days worked in the contract to determine the rate per day and each man in the contract receives his portion of the net earnings of the contract according to the number of days he worked. The amount distributed to the men in each contract must agree exactly with the net earnings of the contract.

It is understood that when a contract has to pay its trammers or other labor, the trammers or laborers do not receive any share in the contract, but are carried and paid as company account labor, and the total of this company account labor performed for each contract is charged up to the respective contracts as a labor cost to the contract. A provision for this charge to the contract is made on "Summary" in Contract Book.

Pay-roll.—Time of each employee is transferred directly from the Check-roll to the Pay-roll, the company account column on the Pay-roll showing number of company account days worked by each man at each rate, while the contract column will show total contract days worked by each man. The contract rates need not be shown on the Pay-roll. The company account time is then extended on Pay-roll. The contract earnings of each employee are collected from contract book and placed on Pay-roll to his credit as a total. The deductions for Doctor, Aid Fund, etc., are then made and Pay-roll footed and balanced. The footings on each page are not carried forward but are summarized at the end of Pay-roll for the month.

When settlements with employees are made during the month, their account should be spread on Pay-roll, and under no condition shall a due bill or check be made in favor of an employee from any other source than Pay-roll book.

| | | | |
|---|--|---|--|
| OLIVER IRON MINING COMPANY. GENERAL OFFICES: EXCHANGE BUILDING, DULUTH, MINN. | | TO SUNDRY EMPLOYEES, DR. | |
| For Personal Services rendered at the Company during the month of _____, 19____, as shown in detail by the Records at the Mine Office. Less Advances \$/¢ # _____ | | Mine of this _____, 19____, as shown in detail Less Sundry Credits, Net Amount, _____ Balance Payable, _____ | |
| The above figures are amounts earned and due for labor performed, as shown by Time Books, Pay Rolls and Ledger at the Mine Office, and are correct; the net amount for entry on the General Books of and for payment by Oliver Iron Mining Company. | | | |
| Correct: | | Approved: | |
| CHIEF CLERK. _____ Approved for payment: _____ | | SUPERINTENDENT. _____ Entered: _____ | |
| FOR PRESIDENT. _____ RECEIVED. _____, 19____, of OLIVER IRON MINING COMPANY, _____ DOLLARS, _____ 100 Pay Roll Account. | | AUDITOR. _____ | |
| To be deposited to Credit of _____ | | | |

FIG. 11.—FORM 119.

made on vouchers provided by the General Office for that purpose. The first entry will be an Accounts Payable voucher (form 119, Fig. 11), covering net amounts of Pay-roll, that is amount for which checks will be drawn. This entry will show gross amount of Pay-roll, less Pay-roll collections for which no checks will be drawn, and the net amount of payment. This latter amount should show on back of voucher opposite the Mining Labor account number of the respective mines.

The second entry (form 113, Fig. 12) will cover the amount of Pay-roll collections shown on the above entry, and will be a charge to "Mining

| OLIVER IRON MINING COMPANY. | | | |
|---|---|---|--|
| JOURNAL ENTRY VOUCHER. | | | |
| DEBIT MINING LABOR. | | CREDIT SUNDRY ACCOUNTS. PAY ROLL COLLECTIONS FOR MONTH. | |
| 19 | For Collections made on Pay Rolls at _____ Mine during month of _____ 19____ this amount having been deducted on Accounts Payable Voucher covering Mining Labor for same month. | | |
| Tenement Rentals, Machinery Rentals, Cash Sales, Labor Supplies, | | (Reverse Side) OLIVER IRON MINING CO. JOURNAL VOUCHER OF PAY ROLL COLLECTIONS. Entered _____ No. _____ Journal Folio _____ 19____ BOOKKEEPER _____ | |
| See Accounts Payable Voucher No. _____ | | | |
| Correct, _____ Approved, _____ AUDITOR. _____ | | The above amounts represent deductions on Pay Roll at _____ Mine during month of _____ 19____, and is correct for entry on General Books of OLIVER IRON MINING COMPANY. SUPERINTENDENT. _____ | |

FIG. 12.—FORM 113.

Labor," and a credit to "Rentals," "Supplies," Garnishee and Collection Fees, Cash, Sales, or such other items as may be found necessary. The charges to mining labor on Form 113-9, Figs. 11 and 12, should equal gross amount of Pay-roll and should be checked against total of Labor Classification before being forwarded.

The third entry will be a credit to Mining Labor and a charge to Direct Expense, Operating, General Repairs, Supplies, New Construction, and so on as per form 116, Fig. 13. The credit to Mining Labor on this form should equal charges to Mining Labor on the preceding forms.

The fourth entry will be a credit to Mining Supplies charge to Direct Expense, Operating, General Repairs, New Construction, etc., as per form 115, Fig. 14. This voucher should cover total of all supplies disbursed during the month with the exception of supplies collected for on Pay-roll, which will appear on form 113, Fig. 12. This voucher should be made from Summary of Supplies Used, furnished by the Warehouse Clerk.

| OLIVER IRON MINING COMPANY. | | | |
|--|--|--|--|
| JOURNAL ENTRY VOUCHER. | | | |
| DEBIT SUNDRY ACCOUNTS. | | CREDIT MINING LABOR. | |
| For Mining Labor employed for the various accounts shown below at during month of 19 | | Mine, | |
| Direct Expense, Operating, General Repairs, Total Operating, Mining Supplies, New Construction, Improvements, Miscellaneous Profit and Loss, Accounts Receivable, | <div style="border: 1px solid black; padding: 5px; text-align: center;"> (Reverse Side) OLIVER IRON MINING CO. JOURNAL VOUCHER OF MINING LABOR. Entered Journal Folio _____ No. _____ 19 BOOKKEEPER </div> | | |
| Total Credit to Mining Labor, | | | |
| The above is a summary of Mining Labor and for what account such Labor was performed at _____ Mine, during month of _____ 19 as shown by Pay Roll Record and Time Books in the Mine Office, and is correct for entry on General Books of Oliver Iron Mining Company. | | Correct, Approved, _____ CHIEF CLERK. _____ SUPERINTENDENT. _____ AUDITOR. | |

FIG. 13.—FORM 116.

The fifth entry will cover estimated Taxes and Insurance for the month as per form 114. Insurance will be separated to show amount chargeable on Mine buildings and amount chargeable to Dwellings rented or to be rented. Insurance on superintendent's residence or such dwellings as are furnished employees without rent should be charged to Mine buildings; the total Insurance on Mine buildings only will be shown on Mine Cost Sheet.

The sixth entry will be made on form 120, covering cash collections for the month. The entry will be charge Cash Sales and credit Garnishee and Collection Fees, Rentals, Accounts Receivable, etc. This entry should credit all items sold for cash except supplies which will receive credit on

form 115, Fig. 14. Where the collections are too numerous to show details on the voucher, a statement giving details should be attached to the voucher. All cash collections should be remitted to the General Office at the end of each month, with a letter stating that the cash should be credited to Cash Sales.

General.—In addition to the above vouchers there will be the monthly Ore Reports, Analysis of Direct Expense, form 127, Fig. 15, New Construction, Misc. Profit and Loss (form 202, Fig. 16), Improvements.

| OLIVER IRON MINING COMPANY. | | | |
|--|--|--|--|
| JOURNAL ENTRY VOUCHER. | | | |
| DEBIT SUNDRY ACCOUNTS. | | CREDIT MINING LABOR | |
| For Mining Supplies consumed at as shown in detail by the records in the Mine Office. | | Mine of this Company, during month of 19 | |
| Direct Expense, Operating, General Repairs, Total Operating, New Construction, Improvements, Miscellaneous Profit and Loss, Accounts Receivable, Cash Sales | <div style="border: 1px solid black; padding: 5px; text-align: center;"> (Reverse Side) OLIVER IRON MINING CO. JOURNAL VOUCHER OF MINING SUPPLIES USED. Entered Journal Folio _____ No. _____ 19 BOOKKEEPER </div> | | |
| Total Credit to Supplies, | | | |
| The above is a summary of Mining Supplies consumed at _____ Mine, during month of _____ 19, as shown by Mine Supplies Used Book and Ledger, and is correct for entry on General Books of Oliver Iron Mining Company. | | Correct, Approved, _____ CHIEF CLERK. _____ SUPERINTENDENT. _____ AUDITOR. | |

FIG. 14.—FORM 115.

The General Office will also require a copy of the Mine Cost Sheet at the earliest possible date.

If there are any charges out of the ordinary on any entry coming from mines to General Office, such as charges to Idle Mines Supplies, Profit and Loss, a new exploration, etc., details should be given to enable the General Office to handle the charge promptly without writing the mine for particulars.

Vouchers—Operating (Mine Books).—As soon as General Office entries and reports are forwarded work on Mine Cost Sheet should be commenced. First make a journal entry on credit voucher charging

[illegible]

FIG. 18.—FORM 50.

before Taxes and Insurance are added. The cost per ton is obtained by dividing the amount of different classes of supplies by the production, and the cost per ton should be figured to three decimal places. Total of labor and supply columns and amount of Taxes and Insurance and Direct Expense on Cost Sheet should be checked carefully with figures reported to General Office on monthly journal vouchers.

Labor Sheets.—Form 50, Fig. 18. The number of days and earnings of each class of employees for the statement must be secured from Labor Classification. Divide the number of days worked by actual working days in the month as shown in list furnished by the Auditor, to obtain the number of men for the month. The number of men should be figured to one decimal place. The rate per day is obtained by dividing earnings of each class of labor by the actual number of days worked by the respective classes of labor. Cost per ton is obtained by dividing earnings by production. The number of days on the labor sheet should agree with the total days shown on Pay-roll, and the total earnings should agree with gross amount of Pay-roll. The contract and company account days and earnings for lower part of the labor statement as well as the number of feet of Drifts, Shafts, Raises or Winzes, may be obtained from Labor Classification. The supplies are reported by the Warehouse Clerk and should agree with supplies on the Cost Sheet. The total hoist of ore and rock usually represents the tons trammed. The difference between the total tons of ore produced and the number of tons obtained from development work, gives the number of tons stoped. Obtain the number of men and rate per day by same method used in upper portion of the statement. Determine the cost per foot of shafts, raises or winzes and drifts, by dividing sum of earnings, company account and contract and the supplies, by the number of feet of Shafts, Raises, Winzes and Drifts. The cost per ton for Stoping and Trimming is obtained by dividing the sum of earnings of trammers and the supplies used, by number of tons stoped or trammed.

Feet and tons per man per day are obtained by dividing feet Sunk, Drifted, or Raised, etc., by the number of days worked on each, and the tons stopped or trammed by same method.

The difference between earnings on Labor Sheet and labor on Cost Sheet should be explained by supplementary statement under "Remarks Column," something as follows:

- Total Labor as per Cost Sheet
Add Labor charged Construction
Add Labor charged Supplies
Add Labor charged Accounts Receivable
Add Labor charged, etc.
Total Labor as per Labor Statement.

MINING AND MILLING NATIVE COPPER

In the Lake Superior Copper District, copper is found in its native state, distributed through the vein rock. These copper bearing veins vary from 14 ft. to 60 ft. or more in width, and have a dip, varying from 26 degrees to 80 degrees from the horizontal.

The vein rock after being broken down in the stopes by air drills is sorted by hand, about 40 per cent. being discarded and used to fill worked out stopes. The good rock is loaded into cars by hand and trammed to the shaft, dumped into the skip and hoisted to the Rock House at surface. The skips dump automatically, the rock running over grizzlies; the coarse rock is crushed in Blake type crushers for shipment to the mill. The railroad tracks run directly under the rock house so that the rock can be loaded into the cars by gravity for shipment to the mill in train loads.

HEAD OFFICE LEDGER ACCOUNTS

Capital Stock (paid in).—To this account is credited the amount of the Capital Stock of the company (paid in). The debit for this journal entry is to "Subscription." As assessments are paid the amount of the Capital Stock account is increased by the amount of the assessment called.

58

Loss and Gain

NOTE.—Debit accounts are underlined and the items below it are either sub-accounts or direct charges of it. The word consumer refers to the manufacturer.

HEAD OFFICE LEDGER ACCOUNTS

| General accounts | Sub-accounts |
|-------------------------|--|
| Capital Stock (paid in) | |
| Vouchers Payable | |
| Subscription | |
| Assessments | |
| Mining Property | |
| Furniture and fixtures | |
| Cash | |
| Notes Receivable | |
| Accounts Receivable | |
| Mine Agent | |
| Loss and Gain | |
| Copper (sales) | |
| Construction | <ul style="list-style-type: none"> Mining Expense Development Transportation Stamping Surface Office Incidentals |
| Operating Account..... | <ul style="list-style-type: none"> Office Expense General Expense Salaries Legal Postage and Stationery Smelting and Selling and Freight Interest, Discount, etc. |
| General Expense..... | |

Subscription.—When the corporation was organized the amount of Capital stock offered for public subscription was credited to the Capital Stock account for the amount paid in, which was the subscription price; this account was charged with that amount and as the subscriptions were paid, either in cash or notes, this account is credited and closes. In the event of another issue of stock the account would be opened.

Assessments.—This account is charged with the full amount of Assessments as called, the credit being to the Capital Stock Account (increasing the paid up value). As assessments are paid the Assessment Account will receive credit for the amounts until all are paid when the account closes. A separate account is kept with each assessment.

Mining Property.—To this account is charged the original cost of the mining property, also the cost of additional lands that may be purchased from time to time.

Furniture and Fixtures.—To this account is charged all office furniture and fixtures, typewriters, adding and calculating machines, etc.

Cash Account.—This account shows the receipts and disbursements of cash each month as per cash book.

Notes Receivable.—To this account is charged the face value of all notes received in exchange for Stock, Cash, Copper or property. As the notes are taken up this account will receive credit.

Accounts Receivable.—This account shows the amount due the company from the sale of copper, property, etc. Separate accounts are kept with each corporation or individual.

Mine Agent.—To this account is charged all funds furnished the Mine Agent to carry on operations at the property. The account receives credit each month for the following charges, as per report furnished by the Mine Agent.

| | |
|----------------------|--------------------------|
| Construction..... | Dr. Construction Account |
| Mining Expense..... | } Dr. Operating Expenses |
| Development..... | |
| Transportation..... | |
| Stamping..... | |
| Surface Expense..... | |
| Office Expense..... | |
| Incidentals..... | |

The difference between the debits and credits of this account is represented by:

| | |
|-----------------------|---------------------|
| Cash | Supplies |
| Fuel | Accounts Receivable |
| Less Accounts Payable | |

The above as shown by trial balance of mine books.

Loss and Gain.—The following accounts are closed into this account each month by journal entry.

| | |
|--------------|-------------------|
| Copper | Operating Expense |
| Construction | General Expense |

Copper.—This account is credited with all sales of copper.

Construction.—This account is charged with all construction items as per Mine Agent's report each month. Credit Mine Agent.

Operating Expense.—This account is charged with all operating expenses each month as per Mine Agent's report. This account comprises the following accounts:

| | |
|----------------|--------------------|
| Mining Expense | Surface Expense |
| Development | Office Expense |
| Transportation | Incidental Expense |
| Stamping | Credit Mine Agent |

General Expense.—This account is composed of the following sub-accounts:

Office Expense.—Rent, heat, light, janitor, etc.

Postage and Stationery.—Stamps, stationery, printed matter, and misc. office supplies.

Legal Expenses.—

Salaries.—Corporation officers, general manager, office clerks.

General.—Directors' fees, traveling expenses, corporation expenses, telegrams and subscriptions.

Smelting and Selling.—

Interest and Discount.—

All salaries and invoices are paid by check; the voucher system is used, a voucher being made out and the amounts entered in the Voucher Record to the proper account.

In the Annual Report furnished to stockholders a financial statement appears, of which the following is an example.

FINANCIAL STATEMENT

TRIAL BALANCE APRIL 30, 1910

| | | |
|------------------------------|--------------|------------|
| Capital Stock (paid in)..... | \$924,000.00 | |
| Vouchers Payable..... | 10,247.13 | |
| Mining Property..... | \$459,919.29 | |
| Accounts Receivable..... | 18,406.81 | |
| Cash..... | 44,330.18 | |
| Supplies..... | 15,320.26 | |
| Loss and Gain..... | 396,270.59 | |
| | 934,247.13 | 934,247.13 |

CURRENT ASSETS AND LIABILITIES

Assets

| | |
|--------------------------|-----------|
| Accounts Receivable..... | 18,406.81 |
| Cash..... | 44,330.18 |
| Supplies..... | 15,320.26 |
| | 78,057.25 |

Liabilities

| | |
|--------------------------------------|-------------|
| Vouchers Payable..... | 10,247.13 |
| Assets in excess of liabilities..... | \$67,810.12 |

RECEIPTS AND EXPENDITURES

Receipts

| | |
|-------------------------------|------------|
| Cash on hand May 1, 1909..... | 38,437.58 |
| Calls paid..... | 66,744.00 |
| Interest..... | 2,370.54 |
| Bills Receivable..... | 64,230.00 |
| | 133,344.54 |
| | 171,782.12 |

Expenditures

| | |
|------------------------------------|------------|
| Mining Property..... | 24,000.00 |
| Operating Expenses..... | 93,749.82 |
| Construction..... | 9,501.86 |
| Office, General, Legal, Salaries.. | 5,401.60 |
| | 132,653.28 |

Less

| | |
|--------------------------------------|------------|
| Increase in Vouchers Payable... | 3,714.88 |
| Decrease in Supplies..... | 1,356.93 |
| Decrease in Accounts Receivable..... | 129.53 |
| | 5,201.34 |
| | 127,451.94 |

Cash on hand April 30, 1910..... \$44,330.18

MINE ACCOUNTS—MINE BOOKS

| General Ledger | SIDE LEDGER | | |
|-------------------------|--|--|---|
| | Sub-accounts | Closed Accounts | Shop Accounts |
| 1. General Expenditures | A separate account for each Building Equipt. of each plant Water lines Sewer lines Air lines—Surface Electric lines Dams Railroad Trestles Port. Machy. and Equipt. | 0-10. Steam Plant 0-12. Elect. Lt. and Power 0-13. Compressor 0-14. Power Drills 0-15. Air lines 0-16. Trammig 0-17. U. G. Tracks 0-18. U. G. Cars 0-19. Pumping 0-20. Timbering 0-21. Gen. U. G. Expense 0-22. Hoisting 0-23. Rockhouse 0-24. Water Supply 0-25. Heating System 0-26. Co. Team a/c 0-27. Clearing Land 0-29. Highways 0-29. Rents | 0-1. Teaming 0-2. Carpenters 0-3. Machinists 0-4. Blacksmiths 0-5. Electricians 0-6. Eng. Dept. 0-7. Masons |
| 2. Construction | A separate account for Sinking each Shaft Construction ditto Plats each shaft Each Cross-cut | (Stamp Mill) 0-40. Steam Plant 0-41. Pumping 0-42. El. Lt. and Power 0-43. Rolls 0-44. Regrinding 0-45. Screens and Elevators 0-46. Jigs 0-47. Tables and Vanners 0-48. Conveyor 0-49. Laboratory 0-50. Wash Account 0-51. General Expense 0-52. Rents | 0-55. Surface 0-56. Teaming 0-57. Carpenters 0-58. Machinists 0-59. Blacksmiths 0-60. Electricians 0-61. Masons |
| 3. Development | Each Raise Each Winze Each Drift Diamond Drilling Surface Exploring | | |
| 4. Mining Expense | A separate account for each stope | | |
| 5. Transportation | | | |
| 6. Stamping | 6-1. Head No. 1 6-2. Head No. 2 | | |
| 7. Surface Expense | | | |
| 8. Office Expense | 8-1. Purchase Office 8-2. Mine Office | | |
| 9. Incidentals | | | |
| 10. Cash | | | |
| 11. Treasurer | | | |
| 12. Bills Audited | | | |
| 13. Sundry Labor | | | |
| 14. Taxes | | | |
| 15. Insurance | | | |
| 16. Aid Fund | | | |

MINE ACCOUNTS—MINE BOOKS—*Concluded*

| MINE ACCOUNTS—MINE LOGS | |
|--|--|
| General Ledger Controlling Accounts | SIDE LEDGER |
| | Sub-accounts Closed Accounts Shop Accounts |
| 17. Supplies..... | 17-1. General |
| | 17-2. Iron and Steel |
| | 17-3. Explosives |
| | 17-4. Cement, etc. |
| | 17-5. Lumber, etc. |
| | 17-6. Machinery |
| | 17-7. Pipe and Fitts. |
| | 17-8. Oils and Grease |
| | 17-9. Electric |
| | 17-10. Tools |
| | 17-11. Mill |
| 18. Fuel..... | 18-1. Soft Coal |
| | 18-2. Hard Coal |
| | 18-3. Bloss Coal |
| | 18-4. Coke |
| | 18-5. Family Wood |
| | 18-6. Boiler Wood |
| 19. Accounts Receivable | 18-7. Mill |
| | |
| 20. Deferred Accounts.... | 20-1. Loss and Gain on Supplies, Adjustment |
| | 20-2. Manufacturing Supplies |
| | 20-3. Hoisting Ropes |

GENERAL LEDGER ACCOUNTS

1. General Expenditures.—The following general ledger accounts are closed into this account each month by journal entry.

- | | |
|-------------------|--------------------|
| 3. Development | 7. Surface Expense |
| 4. Mining Expense | 8. Office Expense |
| 5. Transportation | 9. Incidentals |
| 6. Stamping | |

2. Construction.—This account comprises all Construction sub-accounts in the side ledger. The construction schedule calls for a separate account for each Building.

- | | |
|---------------------------|--|
| B. Equip't. of each plant | F. Dams |
| C. Water lines | G. Railroads |
| D. Sewer lines | H. Coal trestles |
| E. Air lines on surface | I. Portable machinery and equip't., etc. |

See construction side ledger accounts for details.

3. Development.—This account comprises all Development sub-accounts in the side ledger. The Development schedule calls for separate accounts as follows:

- A. Sinking each shaft
- B. Construction of each shaft (Timbering, tracks, piping, etc.)
- C. Plats, each shaft
- D. Each crosseut
- E. Each raise
- F. Each winze
- G. Each drift
- H. Diamond drilling
- I. Surface exploration

See side ledger accounts for details.

4. **Mining Expense.**—This account comprises all Stoping accounts in the side ledger. A separate account is kept with each stope.

5. **Transportation.**—To this account will be charged the following items:

[illegible]

FIG. 19.—FORM 25.

- Freight on rock to stamp mill
Freight on mass copper to smelter
Freight on mineral to smelter
Labor loading rock cars
Labor loading mass copper
Repairs to mineral cars

The Surface foreman will superintend the loading of Rock cars, and as Rock trains are made up for shipment to the mill he will make out a list in duplicate, on form 25, Fig. 19, showing the car numbers and the shaft they come from, also date and time of day noted. The train conductor will sign this report in duplicate; the original goes to the Mine Clerk; the duplicate will be delivered to the Mill Superintendent or some one authorized by him to receive it. In the event of a car being set out of the train for any reason between the mine and the mill, the conductor will note same on the report; this enables the mine and mill to keep accurate track of shipments.

These train reports are tabulated in a book, ruled for the purpose, form 23, Fig. 20, segregating the shipments from each shaft each day. Car numbers only will be shown. Each car is rated at 41 tons capacity.

| ROCK SHIPMENTS | | | | | | | | | | Month of.....19..... | |
|----------------|---|---|---|---|---|---|---|---|------|----------------------|------|
| Date | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | etc. | Total | Tons |
| Shaft No.1 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Shaft No. 2 | | | | | | | | | | | |
| Total | | | | | | | | | | | |
| Total Cars | | | | | | | | | | | |

FIG. 20.—FORM 23.

This will give a complete record of shipments to the Mill. The Rock shipped Train Reports are the basis on which settlement is made with the railroad for freight charges.

Mass copper is shipped in car loads to the smelter direct from the mine. If a track scale is convenient the empty car will be weighed before and after loading, if not the mass will be weighed on a portable

scale as loaded. This will be done under the supervision of the Surface foreman who will report weight of car to the Mine Clerk. Mass shipments are entered in the "Mineral and Mass Shipments" record as mentioned below.

Mineral is shipped from the mill to the smelter in special steel hopper cars. For the convenience of the smelter, grades 1, 2, 3, 4 will be shipped together and Headings and Barrel work together. A report covering each car of Mineral shipped is made out in triplicate, in the following form, form 34, Fig. 21. Copy to the Smelter, Mine Clerk and one retained at Mill.

| REPORT OF MINERAL SHIPPED | | | |
|--|--------------------------|-----------------|--|
| Gentlemen: | | Date..... | |
| Car No.....containing mineral as stated below was shipped to your works on the above date. | | | |
| No. Barrels | Grade | Net Mine Weight | |
| | Total as per last report | | |
| | H. Stamps | | |
| | No. 1 " | | |
| | " 2 " | | |
| | " 3 " | | |
| | " 4 " | | |
| | Barrel Work | | |
| | Mass Copper | | |
| | | | |
| | Total | | |
| Yours truly, | | | |
| Mill Supt. | | | |

FIG. 21.—FORM 34.

These reports of mineral shipped will be entered in the record of "Mineral and Mass Copper Shipped," form 29, Fig. 22. For this purpose a book ruled as per the following illustration will best serve the purpose.

6. Stamping.—This account comprises the sub-accounts in the side ledger with each Stamp Head.

| MINERAL AND MASS COPPER SHIPPED TO THE SMELTER.....1911 | | | | | | | | | | |
|---|----------|--------|-------|------|----------|---|---|---|---|-------|
| Date | Car | | Mass. | Hds. | Brl. Wk. | 1 | 2 | 3 | 4 | Total |
| | Initials | Number | | | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| <hr/> | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| Totals | | | | | | | | | | |

FIG. 22.—FORM 29.

7. Surface Expense.—Charge to this account:

All Surface labor as per time book
Supplies as per supply book

Closed off each month on a basis of labor performed to the various accounts benefited.

Water supply, proportion
Elect. light and power, proportion
Highways
Clearing land
Fire protection
Rents, balance for the month

These items constitute Surface Expense together with any charges which may come from the Surface account.

8. Office Expense.—This account comprises the following sub-accounts in the side ledger.

- 8-1. Purchasing Office
- 8-2. Mine Office

9. Incidentals.—To this account will be charged such items as follows:

| | |
|-------------------|---------------------------|
| Taxes | Periodicals—Subscriptions |
| Insurance | Telegrams |
| Traveling Expense | Misc. items |

10. Cash Account.—This account is kept in the usual way, showing cash Receipts, Disbursements and balance on hand as per details shown in the cash book.

11. Treasurer's Account.—All funds received from the Treasurer will be placed to the credit of this account. In the event of the mine office making any expenditure on account of the purchase of any land, or any expenses in connection with the purchase of land, the expenditure so

made will be charged to this account. A full explanation of the transaction will be made on the voucher covering such expenditure.

12. Bills Audited.—This account will be credited with the footing of the Voucher Record for the month (Journal entry).

Debit this account with the footings of the "Audited Vouchers Paid" columns in the Cash Book. Posted from the Cash Book each month.

13. Sundry Labor.—Credit this account with the total Gross Earnings of labor as per time books. Labor as per time books for the month is spread on the Cost Sheet (Fig. 84) for distribution to the various accounts. The total of this sheet is the gross earnings for the month and will be placed to the credit of this account by journal entry.

Debit this account with the total footings of the "Sundry Labor" paid columns in the Cash Book, posted each month from the Cash Book in total. Also debit this account with all deductions from the Pay-roll which are credited to other ledger accounts or do not require a check to be drawn in settlement. This will be done by journal entry.

14. Taxes.—The total amount of taxes payable in each calendar year should be anticipated and will be pro-rated one-twelfth each month, chargeable to Incidentals and credited to this account.

When tax statements are paid at the end of the year they will be charged to this account. If the amount of taxes for the year as shown by the statement are not what was anticipated an adjustment of the difference will be made and spread over the remaining months in the fiscal year in equal amounts.

15. Insurance.—The total amount of Insurance premiums payable during the year will be anticipated and will be pro-rated one-twelfth each month, chargeable to Incidentals and a credit to this account.

When Insurance premiums are paid they will be charged to this account. In the event of additional Insurance being taken out during the year, or any changes in the schedule which changes the amount of premiums payable during the year, an adjustment will be necessary to conform to the new conditions. This adjustment made, the balance of the account will be pro-rated equally into the remaining months of the fiscal year.

In order to carry the proper amount of insurance on the various buildings and plant equipment, detailed schedule of the cost of each building and the equipment of each plant will be made up as called for by Construction Schedules. From these detailed costs such items as excavation and foundations, etc., will be eliminated and the amount of repairs, also the depreciation of each building and plant equipment will be considered in arriving at the Insurable value of each piece of property.

Copies of the detailed schedules on which Insurance is based will be kept on file at the general office for quick reference in the event of fire.

Any amount received from the Insurance companies to cover loss and damage by fire, will be placed to the credit of the various accounts sustaining loss, according to the amounts allowed in the settlement schedule.

An Insurance map should be kept on file, showing the location, size, and insurable value of each building and plant equipment also all water lines and hydrants, electric and telephone lines. This map should be revised each year.

16. Aid Fund.—Collections on account of the aid fund are made through the Pay-roll. Payments are generally made through the Pay-roll. Collections and payments for this account are made according to the rules of the Aid Fund which follow:

AID FUND RULES

For the purpose of providing an aid fund to cover cases of death or injury by accident, the company agrees with its employees that the following rules shall be observed:

1. Employees whose names appear on the company's books shall be entitled to the benefits of the Aid Fund as hereinafter provided.

2. No person shall be considered as entitled to compensation from the aid fund, until he shall have become a member of it, by having worked at least three days for the company and paid one month's dues into the Treasury.

3. Members' contributions shall be considered as paid at the expiration of said three days, and shall be retained in the mine office until disposed of as hereinafter provided, the agent of the mine or his appointee being treasurer of the Aid Fund. The monthly dues shall be 50 cents.

4. There shall be a committee of five to manage the affairs of the Aid Fund to consist of the following: Head mining captain, Head mine physician, an officer of the company (to be selected by the company), also one miner and one surface man, to be selected by the first three annually.

Members applying for aid must in all cases obtain a certificate from the mine physician and deliver it or cause it to be delivered, to some member of the committee, who shall present it at the next committee meeting. The committee shall have power to accept or reject claims.

No money shall be drawn from the treasury except on the signature of the mine physician and of the member of the committee, representing the department of the mine in which said applicant is employed.

Regular committee meetings shall be held on the first Saturday of each month, at the Head mining captain's office. Special meetings shall be called by the chairman of the said committee, and shall be called by

him at the request in writing of three members of said committee. The committee shall have power to select members to fill vacancies.

5. Members disabled by accident occurring while actually engaged in work or labor for the company, shall recover one dollar for each working day lost thereby, provided that six days shall have been lost as a result of said accident. When a watchman is necessary to watch with the disabled, the committee shall hire a man, and pay him out of the fund, a sum equal to his daily wages for the time he shall have watched.

6. A member injured as above, and at the end of six months permanently disabled by said injury, may be discharged from the Aid Fund on receipt of \$200.00. If only partially disabled he may receive such compensation as the committee may determine.

7. A member disabled as a result of a disability or accident that occurred before his employment by the company is not entitled to the benefits of the Aid Fund.

8. During the period of his disablement as a result of injury, any contributor shall be exempt from the payment of dues.

Any contributor capable of performing an ordinary day's work shall not be considered as disabled.

9. Injuries received by a contributor while engaged in any act, business or employment, other than that assigned them by the company, will not be considered as coming within the provisions of the Rule 5, but injuries received by underground men in going down and coming up from the mine will be considered as entitling them to aid under the rules.

10. When a contributor dies from accidental injuries received while actually engaged in work or labor for the company, there shall be paid from the Aid Fund \$200.00 less funeral expenses (not to exceed \$100.00) when they are incurred or authorized by the committee. It is provided that in all cases of death, the payment shall be made exclusively to the relative, relations, or heir at law, of the deceased in the following order, First to the Widow, Second to the Children, Third to the Parents, Fourth to the Brothers and Sisters if shown to be dependent on the labor of the deceased.

Said payments shall be made in such amounts and at such times as the committee may determine, and when so paid all obligations on the part of the Aid Fund for account of such contributor shall cease.

11. The above amounts shall be paid in lieu of all stated monthly compensation, and when paid all obligations on the part of the Aid Fund for account of such contributor shall cease.

In no case shall the money to be paid as above be applicable to the debts of the deceased or liable to be attached by his creditors of said beneficiaries.

12. No death or disability from sickness will be aided.

In all cases of death, satisfactory evidence will be required that the death resulted from an accidental injury as aforesaid, and not from disease.

13. In case the committee named in Rule 4 shall decide that any one has obtained assistance from the Aid Fund by deceit, he shall be deprived of the benefit of the Aid Fund during such time as said committee shall specify in written notice to him and during the same time he shall be exempt from the monthly charge for dues.

14. The Mine Physician shall keep a record of all cases of accident and he is required to use all possible care and diligence to make his record accurate and complete. In order that such a record may be kept, it shall be the duty of every person who desires or expects to receive aid, to give notice to the mine physician at once, on the occurrence of his disability, and likewise to give notice of the time of resuming work.

To avoid mistakes in names applicants for aid must bring their office pay book or docket, that their names may be entered correctly.

15. All points of dispute shall be decided by the committee and their decision shall be final in all cases.

The mine physician's record will in all cases govern the committee in making the estimates for aid and allowance for compensation.

16. Should a contributor, after giving notice to the mine physician, desire the services of another physician, it is not meant that the above rules shall debar him from that privilege, but the date of his inability and the period of its continuance, must be made known to the committee through the certificate of the mine physician, before favorable action by the committee can be expected. Certificates from other parties will not govern in the disposition of such cases, and to secure favorable action said contributor shall report progress from time to time to the mine physician and be examined by him.

17. When any contributor shall be discharged from the services of the company, or shall voluntarily cease to be an employee of said company he shall have no further claims upon said fund, nor rights to the benefits thereof.

MEDICAL ATTENDANCE

The following rules have been adopted for application to cases where the services of the mine physician may be requested.

1. Every employee of the company by paying the doctor fee as charged against him on the books of the company is entitled to medical attendance (including medicines) in all cases deemed necessary by the

mine physician both for himself and the ordinary members of his family that live under his roof and are dependent on him for support.

2. All children of employees between the ages of 16 and 19 years, if in the employ of the company or earning wages elsewhere and living on the mine location, must have paid the usual doctor fee in order to be entitled to medical attendance.

3. When a child of an employee between 16 and 19 years of age has worked for the company and been charged his fee he is entitled to medical attendance for the balance of the month. If he ceases to work for the company, except on account of disability, or works elsewhere for wages, he cannot after the expiration of the last month for which he has paid the regular fee, claim medical attendance for a member of his father's family. If, however, he shall have ceased to work for the company because of physical disability, he then is entitled to medical attendance equally with any other member of the family. Should said physical disability, however, be the result of injury or disease incurred or contracted during employment away from the mine, he is not entitled to free medical attendance.

4. A married daughter of an employee, not a widow who lives with her father, is not entitled to medical attendance, unless she shall have paid the regular fee in advance.

5. Visitors are not entitled to free medical attendance, employees having visitors that require medical attendance are ultimately responsible for the cost thereof.

6. When an employee of the company quits the latter's service after the tenth day of the month, and leaves his family at the mine, his family is entitled to medical attendance for the balance of that month.

In the protracted absence of the husband, the wife may pay the usual fee in advance and be entitled to medical attendance for himself and family.

7. Contractors living on the mine and generally any person or persons living on the mine not otherwise entitled to medical attendance, under the rules, may be admitted to the benefits of medical attendance for themselves and families, on payment of the usual fee in advance, and giving notice to the clerk of the company of their intention to do so.

8. Employees injured or diseased in consequence of being immoral, intoxicated or disorderly will be charged extra for medical attendance. Such accounts will be collected through the company office, unless promptly adjusted by the party to whom such attendance is rendered.

9. No claim to receive medical attendance will be granted unless good faith be shown by the claimant.

10. All cases not falling under any of the above rules will be passed upon by the company.

17. Supplies.—This account comprises the following sub-accounts in the side ledger:

| | |
|-------------------------|------------------------|
| 17-1. General Supplies | 17- 7. Pipe and Fitts. |
| 17-2. Iron and Steel | 17- 8. Oils and Grease |
| 17-3. Explosives | 17- 9. Electric |
| 17-4. Cement | 17-10. Tools |
| 17-5. Lumber and Timber | 17-11. Stamp Mill |
| 17-6. Machinery | |

18. Fuel.—This account comprises the following sub-accounts in the side ledger:

| | |
|----------------------|-------------------|
| 18-1. Soft Coal | 18-5. Family Wood |
| 18-2. Hard Coal | 18-6. Boiler Wood |
| 18-3. Blossburg Coal | 18-7. Stamp Mill |
| 18-4. Coke | |

19. Accounts Receivable.—This heading is used to cover whatever accounts are necessary with individuals or corporations owing the company for services performed or supplies furnished.

20. Deferred Accounts.—This account comprises the following sub-accounts in the side ledger:

| |
|---|
| 20-1. Loss and Gain on Supplies, Adjustment |
| 20-2. Manufacturing Supplies |
| 20-3. Hoisting Ropes |

SIDE-LEDGER ACCOUNTS—SHOP ACCOUNTS

0-1. Teaming.—Charge this account with expense of

Hired teams as per time book
Co. Team Account.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-2. Carpenters.—Charge this account with:

Carpenters labor as per time book
Supplies as per supply book
Elect. Lt. and Power proportion
Heating System proportion
Repairs to Shop and Equipt.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-3. Machinists.—Charge this account with:

Machinists labor as per time book
Supplies as per supply book
Elect. Lt. and Power proportion
Heating System proportion
Repairs to shop and Equipt.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-4. Blacksmiths.—Charge this account with:

Blacksmith labor as per time book
Supplies as per supply book
Fuel as per supply book
Elect. Lt. and Power proportion
Heating System proportion
Repairs to Shop and Equipt.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-5. Electricians.—Charge this account with:

Electricians labor as per time book
Supplies as per supply book.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-6. Engineering Dept.—Charge this account with:

Engineers and assistants labor as per time book
Supplies as per supply book
Fuel as per supply book
Electric Lt. and Power proportion
Janitor service.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

0-7. Masons.—Charge this account with:

Mason labor as per time book
Supplies as per supply book.

This account is closed out each month on a basis of labor performed, to the various accounts benefited.

Stamp Mill Shop Accounts are similar to the Mine Shop Accounts and are handled in the same way.

SIDE-LEDGER ACCOUNTS—CLOSED ACCOUNTS

0-10. Steam Plant.—Charge this account with:

| | |
|---------------------------------|---------------------------------|
| Firemens labor as per time book | Water supply proportion |
| Coal wheelers as per time book | Elect. Lt. and Power proportion |
| Supplies as per supply book | Repairs to Building and Equipt. |
| Fuel as per supply book | |

This account is closed out each month on a basis of H. P. used, to the various accounts benefited.

Reports.—A monthly report (form 40, Fig. 23), is made out by the Master Mechanic in duplicate from daily reports, Fig. 24.

| OJIBWAY MINING CO. | | | | | | |
|-------------------------------------|------------|----------------------------------|----------------------|----------------------|-------------------------|------------------------------|
| | | | | | | Electric Power Plant Report. |
| Generator No. _____ | | | | Date _____ 19__ | | |
| Av. Volt Meter Reading _____ | | Av. Ammeter Reading _____ | | Power K. W. H. _____ | | |
| Av. Steam Pressure _____ lbs. | | Av. Receiver Pressure _____ lbs. | | Light K. W. H. _____ | | |
| | | Av. Vacuum _____ in. | | Total K. W. H. _____ | | |
| Remarks: _____ _____ _____ | | | | | | |
| <hr/> | | | | | | |
| <hr/> | | | | | | |
| Engineer Day Shift | | | Engineer Night Shift | | | |
| Started up _____ | | | Started up _____ | | Street lights on _____ | |
| Shut down _____ | | | Shut down _____ | | Street lights off _____ | |
| HOURLY READINGS | | | | | | Recording Wattmeter Readings |
| TIME | VOLT METER | AMMETER | STEAM | RECEIVER | VACUUM | POWER |
| | | | | | | Begin Day _____ |
| | | | | | | End Day _____ |
| | | | | | | Begin Day _____ |
| | | | | | | End Day _____ |
| | | | | | | Total _____ |
| | | | | | | LIGHT |
| | | | | | | Begin Day _____ |
| | | | | | | End Day _____ |
| | | | | | | POWER |
| | | | | | | Begin Night _____ |
| | | | | | | End Night _____ |
| | | | | | | Begin Night _____ |
| | | | | | | End Night _____ |
| | | | | | | Total _____ |
| | | | | | | LIGHT |
| | | | | | | Begin Night _____ |
| | | | | | | End Night _____ |

FIG. 26.—FORM 42-A.

The original copy of this report goes to the Superintendent and the duplicate to the Mine Clerk.

0-13. Compressor.—Charge this account with:

Engineers time as per time book
Supplies as per Supply book
Steam Plant proportion
Electric Lt. and Power proportion
Water Supply proportion
Heating System proportion
All repairs to building and plant

This account is closed out each month to the various underground openings on a basis of drill shifts worked. One compressor is steam driven, and one by motor.

Reports.—The Master Mechanic makes out a monthly report (form 41, Fig. 27) in duplicate for each compressor, from daily reports, form 41-A, Fig. 28.

COMPRESSOR REPORT.

Month of _____

| Date | Revolutions | Cu. Ft. Free Air | Air Pressure | Steam Pressure | Temperature Free Air |
|-------|-------------|---------------------|--------------|-------------------|-------------------------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| | | | | | |
| 30 | | | | | |
| 31 | | | | | |
| Total | | | | | |

Master Mechanic

FIG. 27.—FORM 41.

When air is used for pumping or other work, the pumps, etc., will be rated at so many drill shifts by the Master Mechanic so that the whole account is distributed on a basis of drill shifts worked.

0-14. Power Drills.—Charge this account with cost of:

Sharpening Drills
New Drills
Hauling Drills to and from Shafts
Repairing Drill machines, posts and Tripods.

This account is closed out each month. The cost of sharpening and

hauling drills is distributed to the various underground openings on a basis of drill shifts worked. The cost of repairing drill machines is charged to the U. G. openings the machine last worked in. New drills are charged to the opening they are to be used in.

Reports.—The Blacksmith foreman will keep track in a pocket time book, of the drills sharpened for each shaft, separately, each day. He will also keep track of the number of Hand Drills, Moils, Picks sharpened

| OJIBWAY MINING CO. | | | | | | | | | | |
|---|-------|-----------------------------|----------|-------------------------|----------------------|-----------------------------|-------------------|--|--|--|
| Compressor Report | | | | | | | | | | |
| Compressor No. _____ | | | | | Date _____ 191 | | | | | |
| Av. Steam Pressure _____ lbs. | | Av. Air Pressure _____ lbs. | | Revolutions Day _____ | | | | | | |
| Av. Receiver Pressure _____ lbs. | | Av. Vacuum _____ in. | | Revolutions Night _____ | | | | | | |
| Av. Temperature Air Free _____ | | | | | Compressed _____ | | | | | |
| Remarks _____ | | | | | | | | | | |
| Engineer Day Shift _____ Engineer Night Shift _____ | | | | | | | | | | |
| HOURLY READINGS | | | | | | Revolution Counter Readings | | | | |
| TIME | STEAM | AIR | RECEIVER | VACUUM | TEMPERATURE AIR FREE | COMPRESSED | | | | |
| 7 A.M. | | | | | | | Begin Day _____ | | | |
| 8 A.M. | | | | | | | End Day _____ | | | |
| to | | | | | | | | | | |
| 12 .. | | | | | | | | | | |
| 1 P.M. | | | | | | | | | | |
| to | | | | | | | | | | |
| 7 .. | | | | | | | Begin Night _____ | | | |
| 8 .. | | | | | | | End Night _____ | | | |
| to | | | | | | | | | | |
| 12 .. | | | | | | | | | | |
| 1 A.M. | | | | | | | | | | |
| to | | | | | | | | | | |
| 7 .. | | | | | | | | | | |

FIG. 28.—FORM 41-A.

and Drills renewed for each shaft each day. A separate account should be kept of the tools sharpened and repaired for Surface account. The Master Mechanic will report at the end of the month, the totals for the items above mentioned to the Mine Clerk.

A Report, form 30, Fig. 29, showing the "Distribution of Power Drills" is kept by the clerk from information furnished by the shift bosses. They report each shift, the Machine number and where working, or if idle or sent to the shop for repairs, say so.

This report is a monthly report, and is spread on sheets as follows:

| DISTRIBUTION OF POWER DRILLS. Month..... | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|----|--|----|----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 30 | 31 | Tot |
| Drill No. 1-Shaft 1-Level 2-N. | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | 14 |
| Drill No. 1-Shaft 1-Level 2-S. | | | | | | | | 2 | 2 | 2 | | | | 8 |
| Shop | | | | | | | | | | | | | | |
| Drill No. 2-Shaft 2-Level 7-S. | 2 | 2 | 2 | 1 | | | | | | | | x | x | 7 |
| Shop | | | | x | x | x | x | x | x | x | | | | |
| Drill No. 3-Shaft 2-Level 5-N. | 2 | 2 | 2 | 1 | | | | | | | | x | x | 7 |
| Drill No. 3-Shaft 2-Level 6-N. | | | | 1 | 2 | 2 | 2 | 2 | 2 | 2 | | 2 | 2 | 19 |

FIG. 29.—FORM 30.

From this report we get "Total Drill Shifts for the month."

"Total Drill Shifts for each opening."

"Total Drill Shifts for each machine."

A "Power Drill Record," form 43, Fig. 30, is kept for each machine by the Mine Clerk, showing the repairs on each machine in detail, each month, also shifts worked each month. This record covers a period of 12 months. The information for this record is taken from the "Distribution of Power Drills" and Record of Supplies Used.

| POWER DRILL RECORD | | | | | | | | | |
|--------------------|---------------------|------------------------|-------|--------|--------|-------|--|--|--|
| Cost | Type Rand R-3 | Machine Number 4 | | | | | | | |
| | Jan. | Feb. | Mar. | Apr. | Totals | | | | |
| Shifts Worked | 47 | 50 | 42 | 45 | 184 | | | | |
| Chucks | 1 5.00 | | | | 1 | 5.00 | | | |
| Side Rods | 2 .60 | | | | 2 | .60 | | | |
| Ratchets | | 1 .75 | | | 1 | .75 | | | |
| Pawls | | | | | | | | | |
| Pawl Springs | | 2 .50 | | | 2 | .50 | | | |
| Chuck Bolts | | | 1 .70 | | 1 | .70 | | | |
| Chuck Bolt Nuts | | | 2 .10 | | 2 | .10 | | | |
| Feed Screws | | 1 1.50 | | | 1 | 1.50 | | | |
| Handles | | | | 1 .90 | 1 | .90 | | | |
| Cylinders | | | | 1 5.00 | 1 | 5.00 | | | |
| Air Chests | | | | 1 2.00 | 1 | 2.00 | | | |
| Valves | | | | 1 1.75 | 1 | 1.75 | | | |
| Machinist Labor | 1.00 | .75 | | 2.00 | | 3.75 | | | |
| Smith Labor | | | | 2.00 | | 2.00 | | | |
| Totals | 6.60 | 3.50 | .80 | 13.65 | | 24.55 | | | |
| Cost Per Shift | .14 | .07 | .02 | .30 | | .13 | | | |

FIG. 30.—FORM 43.

The above record is intended to cover the cost of keeping up the Power Drills and is not to include any labor or supplies for the repair of drill mountings, such as Tripods, Columns, Column Arms and Clamps. From the above records a special report is made out each month for the Supt., covering the month's operations of Drills. Form 43-A, Fig. 31.

| POWER DRILL RECORD | | | | | | 1911 |
|--------------------|---------------|----------|-------|---------------|----------------------|------|
| Drill Number | Shifts Worked | Supplies | Labor | Total Expense | Cost per Drill Shift | |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| <hr/> | | | | | | |
| <hr/> | | | | | | |
| | | | | | | |
| | | | | | | |
| Totals | | | | | | |

FIG. 31.—FORM 43-A.

0-15. Air Lines.—Charge this account with all labor and supplies to extend Air lines and repair the same underground. In making charges to this account the particular opening where the work is done must be specified.

This account is closed out each month to the various openings benefited with the cost of the work done in the particular opening charged.

Repairs to Air lines between the Compressors and the shafts will be charged to Surface expense.

0-16. Trimming.—Charge this account with cost of all labor trimming as per time book and with supplies used by trimmers (candles, shovels, hammers, etc.).

This account is closed out each month to the various accounts (openings) from which rock is trammed, on a basis of labor performed.

Reports.—A "Trammer Boss's Report," form 36-A, Fig. 32, is made out by the Trammer Bosses each shift for each shaft. They fill in all information called for except tons, wages, distance, per ton 100 ft., which is filled in by the Mine Clerk. The tonnage per car is taken as the average for the previous month as shown by the Summary of Hoisting Record. As all trammers are paid the same wages the figuring of wages is simple. As regards distance, for stopes, raises and winzes it remains permanent, but for drifts and cross-cuts it changes as they advance. A table should be prepared showing the distances from the various openings

to the shafts, in the case of drifts and cross-cuts the figures will have to be changed from day to day as the work advances. The average advance in feet can be added for each shift worked as shown by the Power Drill Record. Cost per ton trammed 100 ft. is arrived at by dividing the cost by the number of tons, this result will then be divided by the number of hundred feet trammed. Distance is figured for one direction only.

The cars of good and poor rock as shown by these reports must check with the Hoisting Report turned in by the hoisting engineer. The time and wages shown must check with the time and wages as shown by the time book, charged to Trammig account.

"Monthly Record of Trammings," form 36-B, Fig. 33, this record is

[illegible]

FIG. 32.—FORM 36-A.

made out from the Shift Boss's reports. The day and night shifts are shown separately on the record. This form is shown on the following page and explains itself.

"Rock Trammed Report."—Form 36-C, Fig. 34.—This record is made up from the Shift Boss's reports, and shows for each opening worked during the month, the cars of good and poor rock, both day and night shift, also cost per ton 100 ft. This record is used both as a comparative record and to furnish information required for the cost sheet.

0-17. U. G. Tracks.—Charge this account with all labor and supplies to lay or change underground tracks. In making charges to this account the particular opening in which the work is done must be specified.

This account is closed out each month to the various openings (accounts) on a basis of cost of work done.

0-18. U. G. Cars.—Charge to this account all labor and supplies to repair tram cars. In making charges to this account the cost of repairing

These sheets give a detailed record of the rock coming from each level during the month from each shaft, and for both day and night shift.

These sheets will be kept up to date by the Mine Clerk.

A "Summary of Rock Hoisted," form 20-B, Fig. 37, record is made out each month by the mine clerk. This record is a summary of the "Rock Hoisted" monthly records. It is self-explanatory.

A "Summary of Hoisting Records," form 20-C, Fig. 38, is made up by the Mine Clerk. This record is different from the Summary of Rock Hoisted in all particulars although most of the information required comes from them. The Stamp rock is the difference between the total hoist and the poor rock discarded. The amount of rock shipped comes from the Rock Shipped record. The average load per skip is arrived at by dividing the tons of rock shipped by the number of skips of good rock hoisted. We assume that the rock bins are full at the first and the last of each month.

0-23. Rock House.—This account is charged with:

Rock House labor as per time book
Supplies used as per supply book
Elect. Lt. and Power proportion
Repairs to building and equipt.

This account is closed out each month to the various openings underground on a basis of tons of rock hoisted from each opening.

0-24. Water Supply.—Charge this account with:

Pumpmen's time as per time book
Supplies as per supply book
Steam Plant proportion
Electric Lt. and Power proportion
Repairs to building and Equipt.
Repairs to pipe lines and hydrants.

This account is closed out each month to the various accounts benefited on a basis of water used. Water furnished to company dwellings, boarding house, and barn will be charged to Surface Expense. The Master Mechanic will report to the Mine Clerk each month the quantity of water pumped.

0-25. Heating System.—Charge this account with:

Steam plant proportion
Supplies used as per supply book
Repairs to Vacuum pump, pipe lines and radiators.

This account is closed out each month to the various accounts benefited on a basis of square feet of radiation in the various buildings heated.

0-26. Company Team Account.—Charge this account with company teamsters as per time book:

Supplies and Forage as per Supply book
Repairs to Barn, Wagons, Sleighs, Harness
Veterinary services.

This account is closed into Teaming each month.

0-27. Clearing Land.—Charge this account with all labor and supplies used incident to clearing and grubbing the same for any purpose. Close this account into Surface Expense each month.

0-28. Highways.—Charge this account with all Surface and Teaming labor also supplies used in building New Highways or repairing old ones on company property. Close this account into Surface Expense each month.

0-29. Rents.—Charge this account with all labor and supplies used to repair and maintain all dwellings and other buildings on which the company collects rent. The charges to this account are intended to cover all cost of repairs and ordinary alterations on buildings mentioned above.

Additions to buildings and new foundations, cellars, etc., will be treated as New Construction.

This account is credited with all rent collected, both for buildings and leased land.

The balance of this account each month is closed into Surface Expense.

Application for Dwelling.—Any employee desiring a dwelling must have worked for the company at least 30 days before an application will be considered. A regular form is used for this purpose as follows, form 19, Fig. 39.

This form must be filled out by the applicant and approved by his foreman before being sent to the Mine Clerk. The allotment of houses is a matter of judgment, with the best interests of the company in view. Houses are allotted by the Superintendent.

Dwelling Lease.—Form 17, Fig. 40. When an application is allowed and a house allotted, the Mine Clerk will make out in duplicate a Dwelling Lease, which must be signed by the Superintendent for the company and by the applicant. The original copy goes to the applicant and the duplicate is placed on file in the mine office. When a dwelling is vacated the lease is so endorsed and removed from the live file.

Land Lease.—Form 18, Fig. 41. A person wishing to lease land from the company for building or other purposes, will make application to the Superintendent, and on the approval of the General Manager, a Land Lease will be made out in duplicate, covering the particular piece of property in question. This lease will be signed by the Superintendent for the company and by the applicant, also by his wife if he is a married man. The original copy goes to the applicant, the duplicate to the mine clerk to be placed on file. In the event of a party disposing of his building and

Ojibway Mining Company

This is to certify that..... has been employed in my department as..... for at least one month last past, and that his work has been satisfactory. I recommend favorable action on his application for a dwelling-house.

190.....

The undersigned hereby makes application for..... a dwelling-house, and promises to fulfil all requirements of the Company in reference to the same, when it shall have been assigned to him.

Name.....
Nationality..... Age..... years
Occupation.....
Married or Single.....
Names and ages of children.....

Name and address of next nearest of kin:.....

Last place of employment.....

Date of application.....

FIG. 39.—FORM 19.

surrendering his lease, a proper surrender and release of the same must be drawn up and signed. The original lease should be surrendered and this release attached to it and placed on file.

DWELLING LEASE

DWELLING OR BOARDING HOUSE LEASE. (COPY)

Form 17 9-7-500

This Agreement, Made this..... day of..... A. D., 19.....
BETWEEN the....., a corporation duly organized under the laws of the State of Michigan, party of the first part, and..... of the County of Keweenaw, party of the second part;

Witnesseth, That said party of the first part hath agreed to let, and hereby doth let, and the said party of the second part hath agreed to hire, and hereby doth hire, the following described premises belonging to the party of the first part, and in said County situated, to-wit:

MINING AND MILLING NATIVE COPPER

To be used and occupied solely for a dwelling house—boarding house for boarding and lodging the employees of the party of the first part by the party of the second part—for which said party of the second part agrees to pay to said party of the first part.....dollars per month for each and every month of such occupation, and a proportional part thereof for any part of a month, payable on the..... day of each month; the first payment to be made on the..... day of..... A. D., 19.... Provided, however, and this lease is upon the following express conditions, to-wit: That if the party of the second part shall refuse or neglect to pay the rent above mentioned at the time above mentioned; or shall let, demise, sell, underlet or assign this lease, or the whole or any part of said premises, without the consent of the party of the first part thereto obtained; or shall sell, or suffer to be sold, in or upon said premises, any spirituous or intoxicating liquors;

or shall refuse or neglect to keep said premises in good preservation (ordinary wear and tear and damages by the elements excepted); or shall continue to occupy or hold, or suffer to be occupied or held, said premises beyond..... days after said party of the second part ceases to be an employee of the party of the first part, whether because of being discharged by the party of the first part, or on voluntarily terminating his relation as employee to the party of the first part. In such and in any such case it is hereby expressly understood and agreed that this lease shall, at the option of the party of the first part, wholly cease and determine, and it shall thereupon be lawful for the party of the first part to re-enter into and re-possess and recover said premises, and the party of the second part, and any other occupant, to remove and put out, and in such or in any such case it is expressly agreed that no notice to quit whatever shall be required to be given by the party of the first part to the party of the second part.

It is further agreed, that should the said party of the first part wish to terminate the tenancy hereby created, for any cause or reason whatsoever, other than those mentioned in the preceding conditions (although said party of the second part should have fulfilled, performed and kept each and every condition and covenant thereof), it may do so at any time by giving said party of the second part..... days' notice of such wish (and such notice shall not be required to terminate at the expiration of any rental period), and at the expiration of such..... days this lease shall wholly cease and determine, and the said party of the first part shall thereupon and without further notice, be entitled to immediate possession of said premises, and to recover the same, and to remove and put out the party of the second part, or any other occupant. The said party of the second part covenants and agrees to keep, perform and observe each and all of the conditions herein mentioned.

It is further agreed, that said first party may retain, out of any moneys due, or to become due, from it to said party of the second part, any rent due or to become due hereunder, and also an amount sufficient to fairly compensate said first party for any injury done, or suffered to be done, to said premises by said party of the second part, contrary to the terms hereof.

In Witness Whereof, The party of the first part hath caused these presents to be signed by its Superintendent, duly authorized, and the party of the second part hath signed the same the day and year first above written.

In Presence of

FIG. 40.—FORM 17.

LAND LEASE

Form 18 9-7- 300

This Indenture, Made this..... day of..... A. D., 190..... between the..... a corporation organized under the laws of the State of Michigan, and doing business in the County of Keweenaw, in said State, party of the first part, and..... of the second part,

Witnesseth, Said party of the first, for and in consideration of the sum of..... Dollars to be paid in each and every month during the tenancy herein provided for, and of the covenants and agreements hereinafter mentioned, has leased, and by these presents does demise and lease, unto the said part..... of the second part,..... executors, administrators and assigns for twenty-one years from the day and date hereof, the surface of the described following premises, to-wit:

all in Keweenaw County, Michigan.

To be used by said part.....of the second part while.....he..... in the employ of the said party of the first part, as a place for the erection of a Dwelling House and its appurtenances, to be occupied by.....and for no other purpose, without the written consent of the said party of the first part first obtained.

It is expressly agreed that said part.....of the second part shall have the use of said land for the purpose above mentioned only while.....continue. in the employment of said first party.

It is further agreed that, whenever said part..... of the second part cease..... to work for said party of the first part, for any cause,..... shall, within..... days, provided the rent then due from said second part..... to said first party is then paid in full, (and if any bonus paid by said first party to second part..... is repaid to said first party by said second part.....) remove any Dwelling House or other buildings and appurtenances erected upon said premises by..... and leave said premises in as good condition as when entered upon; unless said party of the first part elects to purchase said Dwelling House, or other buildings and appurtenances.

It is further expressly agreed that said first party may at any time at its option, upon ninety days' written notice, terminate this lease and purchase said Dwelling House, or other buildings and appurtenances which may have been erected upon said premises by said second party, heirs or assigns. Notice of the election of said first party to so purchase shall be deposited in the United States mail in the Post Office at....., Michigan, enclosed in a sealed envelope, with legal postage thereon fully prepaid, addressed to said part.....of the second party,.....heirs or assigns, at his, her, their, or any of their last known place or places of residences; and on the expiration of ninety days after said notice is so deposited as aforesaid, in said Post Office, said lease shall thereby be terminated.

Whenever under any of the terms of this lease said first party shall elect to purchase said Dwelling House, or other buildings and appurtenances, which may have been erected upon said premises by said second part.....,heirs or assigns, it may do so at the value thereof, to be determined by the Superintendent of said first party and said second part....., or.....heirs, executors, administrators or assigns, within ten days from the date of the notice of the election of said first party to purchase; and in case they cannot agree upon said value within said ten days, then they shall, within five days after the lapse of said ten days, select some competent person to determine the same, who shall determine the same within ten days after his selection: and in any event in computing said value there shall be deducted by the persons or person determining the same, any and all rent then due, or to grow due from said second part.....,heirs or assigns, to said first party, (and also any bonus paid to said second part.....by said first party) which sum after making said deductions, shall be paid by said first party to said second part.....,heirs or assigns, if and when said second part.....,heirs or assigns shall vacate and surrender said premises to said first party.

And it is expressly understood and agreed by the parties hereto, their respective heirs, executors, administrators, successors, and assigns, that the whole amount of rent reserved and agreed to be paid by second party.....for said above demised premises, and each and every installment thereof, (and any bonus that may have been paid by said first party to said second party.....) shall be and are hereby declared to be a valid and first lien upon any and all buildings and improvements that may have been, or that may at any time in the future be erected, placed or put upon said premises by said.....of second party.....heirs or assigns, and that whenever and as often as any installment of rent shall become due, and remain unpaid for.....days after the same becomes due and payable, said party of the first part, its agent, attorney, successors or assigns, may sell at public auction, to the highest bidder, for cash, after having first given notice of the time and place of such sale, by posting up notice thereof in three public places in the Township of.....at least ten days previous to the time of such sale, all the buildings and improvements on said premises, and as attorney of said part.....of the second part, hereby irrevocably constituted, may make to the purchaser or purchasers thereof a suitable and proper transfer, bill of sale or other conveyance and out of the proceeds arising from such sale, after first paying the costs and expenses of such sale, including attorney fees, retain to itself, its successors or assigns, the whole amount due on said lease up to the date of said sale for such rent and bonus, rendering the surplus, if any, to the said part.....of the second part.....heirs, executors, administrators or assigns, which sale shall be a perpetual bar to and against all rights and equities of said part.....of the second part.....heirs, executors, administrators and assigns, in and to the property sold.

Said second part.....also agree.....not to sell or assign this lease without the written consent of said first party, and not to keep for sale, or sell or distribute, or permit to be sold or distributed any merchandise, or any brewed or intoxicating liquors on said premises; a violation of any of the provisions in this paragraph contained shall operate as an immediate forfeiture of this lease, and thereupon said first party, its successors or assigns, may, without notice, immediately bring an action under the statute to oust said second part....., or.....assigns.

In Witness Whereof, The said party of the first part has caused these presents to be executed in its

behalf by its Superintendent, thereunto duly authorized, and said second part.....ha.....set.....
hand.....and seal.....the day and year first above written.

Signed, Sealed and Delivered in presence of }
 }
 } By
 } *Superintendent.*
 } [L. S.]
 } [L. S.]

FIG. 41.—FORM 18.

Rent Record Cards.—In order to keep a proper record of each dwelling, the rent collected, occupants, repairs, etc., a record is kept with each dwelling on cards (form 32, Fig. 42). When a dwelling lease is executed and the duplicate copy is received by the Mine Clerk, he will enter on the Rent Card assigned to the house in question, the date of the lease, the occupant's name, his pay book number and in case he is only

[illegible]

FIG. 42.—FORM 32.

renting part of a house, that is, the up or down stairs, that must also be shown. The rental per month for each dwelling or part thereof is fixed by the Superintendent.

An employee vacating a rented house cannot secure a settlement from the Clerk, until the house has been examined and reported upon by the Carpenter Foreman. Any damage to a dwelling caused by ill usage will be charged to the occupant.

On the reverse side of the Rent Cards will be posted each month the details of any repairs made.

STAMP MILL—CLOSED ACCOUNTS

0-40. Steam Plant Stamp Mill.—Charge this account with:

Firemen as per time book
Coal passers per time book
Water Supply, proportion

Elect. Lt. and Power, proportion
Supplies as per supply book
Fuel as per supply book
All repairs to building and plant.

This account is closed out each month to the various accounts benefited on a basis of horse-power used.

0-41. Pumping Stamp Mill.—Charge this account with:

Engineers as per time book
Steam Plant, proportion
Elect. Lt. and Power, proportion
Supplies as per supply book
All repairs to building and Equipt.

This account is closed out each month to the various accounts benefited on a basis of water used.

0-42. Electric Light and Power Stamp Mill.—Charge this account with:

Engineers as per time book
Steam Plant, proportion
Supplies as per supply book
All repairs to Generating Plant and Equipt.

This account is closed out each month to the various accounts benefited on a basis of kws. used.

0-43. Rolls.—Charge this account with all labor and supplies to operate and maintain the Rolls. This account will be divided between the Heads, on a basis of cost for the month for Rolls for each Head.

0-44. Regrinding.—Charge this account with all the labor and supplies to operate and maintain the Regrinding Mills. This account will be closed out each month to the Heads, on a basis of cost for the month for Regrinders for each Head.

0-45. Screens and Elevators.—Charge this account with all labor and supplies to operate and maintain the Elevators and revolving Screens. This account will be divided between the Heads on a basis of cost of Screens and Elevators for the month for each Head.

0-46. Jigs.—Charge this account with all labor and supplies to operate and maintain all Jigs. This account will be closed out to the Heads each month on a basis of cost of Jigs for the month for each Head.

0-47. Tables and Vanners.—Charge this account with all labor and supplies to operate and maintain the Tables and Vanners. This account will be closed out to the Heads on a basis of cost of Tables and Vanners for the month for each Head.

0-48. Conveyor.—Charge this account with all labor and supplies to operate and maintain the waste sand Conveyor. This account will be closed out to the Heads on a basis of tons stamped.

0-49. Laboratory.—Charge this account with all labor and supplies to operate and maintain the Laboratory. This account will be closed out to the Heads on a basis of tons stamped.

0-50. Wash Account.—Charge this account with,

Wash Foreman as per time book
Wash laborers as per time book
Supplies as per supply book
All labor and supplies to operate and maintain the Wash department except Rolls, Regrinding Mills, Jigs, Tables and Vanners.

This account will be closed out to the Heads on a basis of tons stamped.

0-51. General Expense.—Charge this account with:

Office expense
Surface Expense
Rents—balance
Waters Supply, proportion
Elect. Lt. and Power, proportion
All labor and supplies to repair and maintain the Mill building, Rock bins, Trestles, etc.

This account will be closed out to the Heads on a basis of tons stamped.

0-52. Rents, Stamp Mill.—Charge this account with all labor and supplies to repair and maintain all dwellings and other houses at the mill on which the company collects rent. This account will receive credit for all rents collected. The account is closed out to General Expense.

SUB-ACCOUNTS—SIDE LEDGER

2-1, Etc. Construction Accounts.—A separate account is kept with each.

| | |
|--------------------------|--------------------------------------|
| A. Building | F. Electric and Telephone Lines |
| B. Equipt. of each Plant | G. Dams |
| C. Water Lines | H. Railroads |
| D. Sewer Lines | I. Trestles |
| E. Air Lines on Surface | J. Portable Machinery and Equipment. |

In making charges of labor and supplies to any construction accounts, the following subdivisions will be observed, in order to have proper information of costs in comparing like jobs and for insurance purposes.

BUILDINGS

| | |
|---------------------------------|-----------------------------------|
| A. Excavation | F. Heating plant |
| B. Grading and Filling | G. Bath room fixtures, lavatories |
| C. Foundations | H. Painting inside and out |
| D. Superstructure | I. Barn and outhouses. |
| E. Electric Wiring and fixtures | |

COMPRESSOR EQUIPMENT

- | | |
|--------------------|---------------------------|
| A. Foundations | D. Supplies |
| B. Compressor cost | E. Installation complete. |
| C. Receivers cost | |

ELECTRIC PLANT EQUIPMENT

- | | |
|---------------------------|-----------------------|
| A. Foundations | F. Transmission lines |
| B. Generating outfit cost | G. Telephone lines |
| C. Installation | H. Transformers |
| D. Switchboard cost | I. Misc. |
| E. Installation | |

HOISTING EQUIPMENT

- | | |
|----------------|---------------------------|
| A. Foundations | D. Installation |
| B. Hoists cost | E. Pulley Stands, Sheaves |
| C. Supplies | F. Ropes. |

PUMPING PLANT

- | | |
|--------------------|-----------------|
| A. Foundations | D. Installation |
| B. Pumps cost | E. Misc. |
| C. Condensers cost | |

ROCK HOUSE EQUIPMENT

- | | |
|------------------|-----------------------|
| A. Crushers cost | D. Power Transmission |
| B. Hammers | E. Installation |
| C. Motors, etc. | F. Misc. |

SHOP EQUIPMENT

- | | |
|----------------------------|-----------------------|
| A. Foundations | D. Power Transmission |
| B. Tools itemized | E. Installation. |
| C. Motors and Transformers | |

STEAM PLANT EQUIPMENT

- | | |
|----------------------|-------------------|
| A. Foundations | F. Economizer |
| B. Boilers cost | G. Installation |
| C. Breeching cost | H. Stack complete |
| D. Pumps | I. Misc. |
| E. Feed water heater | |

PIPE LINES

- | | |
|----------------------|---------------------------|
| A. Excavation | D. Pipe covering complete |
| B. Pipe and Fittings | E. Filling. |
| C. Installation | |

DAMS

- | | |
|------------------|------------|
| A. Excavation | C. Filling |
| B. Concrete work | D. Misc. |

RAILROAD

- | | |
|------------------------|-------------------|
| A. Grading and Filling | C. Rails and Ties |
| B. Culverts | D. Misc. |

TRESTLES

- | | |
|---------------|----------|
| A. Excavation | D. Floor |
| B. Piling | E. Misc. |
| C. Structure | |

PORTABLE MACHINERY AND EQUIPMENT

- | | |
|---------------------|---------------------------------|
| A. Rock Drills | F. Portable Hoists |
| B. Pumps | G. Derricks |
| C. Tram Cars | H. Sinking Buckets |
| D. Skips | I. Live Stock |
| E. Portable Boilers | J. Wagons, Sleighs and Buggies. |

Into this account should be charged machinery and equipment that will not be used permanently in one place, so that it cannot be charged to some construction or equipment account.

3-1, Etc. Development Accounts.—Separate accounts will be kept as follows:

- | |
|---|
| A. Shaft Sinking, separate account each shaft. |
| B. Shaft Construction, separate account each shaft. |
| C. Plats, separate account each shaft. |
| D. Crosscuts, separate account each one. |
| E. Raises, separate account each one. |
| F. Winzes, separate account each one. |
| G. Drifts, separate account each one. |
| H. Diamond Drilling. |
| I. Surface Exploration. |

Each of these accounts is made up of the following, except Diamond Drilling and Surface Exploration.

- | | |
|--------------------------------------|-----------------------------|
| A. Miners labor | G. Pumping, proportion |
| B. Miners supplies | H. Timbering, proportion |
| C. Compressor, proportion | I. Tramming, proportion |
| D. Air lines, proportion | J. U. G. Cars, proportion |
| E. Power Drills, proportion | K. U. G. Tracks, proportion |
| F. General U. G. Expense, proportion | L. Hoisting, proportion |
| | M. Rock House, proportion. |

The cost of Shaft Sinking is intended to cover all labor and supplies used by miners in sinking plus a proportionate part of the other accounts. This statement also applies to Drifting, Raising, Winzes, Crosscuts and Plats.

The cost of Shaft Construction is intended to cover all labor and supplies used for Timbering, building Skipway and Tracks, Ladder road, Concrete Collar, Water lines, Air lines, Bell lines. The cost of Diamond Drilling is intended to cover all labor and supplies used in running and

maintaining the drill and moving the same from place to place, plus a proportionate part of Compressor expense for power.

Surface Exploration is intended to cover all labor and supplies used in surface trenching, etc.

For Diamond Drill work a daily report is made out by the drill runner on (form 60, Fig. 43), covering the operations and results of the work for the shift; reports for each shift worked will be sent to the Superintendent.

| | | | |
|----------------------------------|---------|------------|--|
| Form 60 | | MINING CO. | |
| Daily Report. | | Shift | |
| Name of Drill | | | |
| Number of Hole | | 190 | |
| Depth from Surface, end of Shift | | Feet | |
| " " " beginning " " | | | |
| Distance Drilled, - - - | | | |
| inch Stand Pipe put in, | | | |
| " Casing " " | | | |
| From Feet | To Feet | Material | |
| | | | |
| | | | |
| | | | |
| Remarks | | | |
| Foreman. | | | |

FIG. 43.—FORM 60.

The details of the cost of Diamond Drilling is entered on cards (form 61, Fig. 44) the cost data on one side and the operating data on the other side.

4-1, Etc. Mining Expense, Stopping.—A separate account is kept with each stope, made up of the following:

- | | |
|--------------------------------------|-----------------------------|
| A. Miners' labor | G. Pumping, proportion |
| B. Miners' supplies | H. Timbering, proportion |
| C. Compressor, proportion | I. Tramming, proportion |
| D. Air lines, proportion | J. U. G. Cars, proportion |
| E. Power Drills, proportion | K. U. G. Tracks, proportion |
| F. General U. G. Expense, proportion | L. Hoisting, proportion |
| | M. Rock House, proportion. |

| | | | | | | | | | | | | | | | | | | | |
|------------------------|--|--|--|--|--|--|--|--|--|------------------------|--|--|--|--|--|--|--|--|--|
| OPERATING DATA | | | | | | | | | | COST DATA. | | | | | | | | | |
| Maker of Drill | | | | | | | | | | Diamond Drill Hole No. | | | | | | | | | |
| Drill No. | | | | | | | | | | Company | | | | | | | | | |
| Diameter of Core | | | | | | | | | | Date begun | | | | | | | | | |
| Date Finished | | | | | | | | | | Total Time | | | | | | | | | |
| Time Consumed | | | | | | | | | | COST IN DOLLARS | | | | | | | | | |
| Days Labor | | | | | | | | | | Labor | | | | | | | | | |
| Feet Drilled per Shift | | | | | | | | | | Teaming | | | | | | | | | |
| Feet per Man per Shift | | | | | | | | | | Coal and Supplies | | | | | | | | | |
| No. Men Employed | | | | | | | | | | Diamonds | | | | | | | | | |
| Use of Machine | | | | | | | | | | Total | | | | | | | | | |
| Cost per Foot of Ledge | | | | | | | | | | Feet | | | | | | | | | |
| Moving & Setting up | | | | | | | | | | | | | | | | | | | |
| Stand Pipe | | | | | | | | | | | | | | | | | | | |
| Drilling Ledge | | | | | | | | | | | | | | | | | | | |
| Totals | | | | | | | | | | | | | | | | | | | |
| Cost per ft. of Hole | | | | | | | | | | | | | | | | | | | |
| Cost per ft. of Ledge | | | | | | | | | | | | | | | | | | | |

FIG. 44.—FORM 61.

[illegible]

FIG. 45.—FORM 105.

| OJIBWAY MINING COMPANY | | | | | | | | | | |
|---|-------------|----------|------------------|--------|---------------------------|-------------|------|------------------|--------|-----------|
| MILL DEPARTMENT | | | | | | | | | | |
| Daily supply report for 24 hrs. beginning 7 A.M. _____ | | | | | | | | | | 191 _____ |
| SHOES | | | | | | | | | | |
| Old shoes taken off | | | | | New shoes put on | | | | | |
| Head No. | Maker | Mark | Time | Weight | Head No. | Maker | Mark | Time | Weight | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| OILS AND WASTE | | | | | | | | | | |
| Where used | | Cylinder | | Engine | | Lubricating | | Oil put in tanks | | |
| Heads | | | | | | | | | | |
| Wash | | | | | | | | | | |
| Mill | | | | | | | | | | |
| Boilers | | | | | | | | | | |
| Pumps | | | | | | | | | | |
| | | | | | | | | | | |
| Tank reading | | | | | | | | | | |
| Report name, gallons and kind of oil put in tanks. | | | | | | | | | | |
| REPAIRS | | | | | | | | | | |
| Repairs include all castings (hard and soft) grates, screens and liners of all kinds. | | | | | | | | | | |
| Head No. | Casting No. | Weight | NAME AND REMARKS | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| REMARKS | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Millrunner 7 A.M.- 6 P.M. | | | | | Millrunner 6 P.M.- 7 A.M. | | | | | |

FIG. 46.—FORM 106.

The cost of Stoping is intended to cover all labor and supplies for breaking rock in stopes, plus proportionate part of the other accounts.

6-1, Etc. Stamping Head No. 1-Expense and Head No. 2-Expense.—

These accounts comprise the following charges:

- | | |
|----------------------------------|-------------------------------------|
| A. Mill runners as per time book | I. Revolving Screens and Elevators, |
| B. Head runners as per time book | Proportion |
| C. Head feeders as per time book | J. Rolls, proportion |
| D. Spare hands as per time book | K. Regrinding, proportion |
| E. Steam Plant, proportion | L. Surface |
| F. Pumping, proportion | M. Carpenters |
| G. Elect. Lt. and Power-Power, | N. Machinists |
| proportion | O. Blacksmiths |
| H. Elect. Lt. and Power-Light, | P. Teaming |
| proportion | Q. Electricians |
| | R. Supplies |

WASH

- | | |
|-------------------------------|-------------------------------|
| A. Foreman, proportion | F. Electric Power, proportion |
| B. Labor, proportion | G. Jigs, proportion |
| C. Shop Labor | H. Tables, proportion |
| D. Supplies | I. Conveyor, proportion |
| E. Electric Light, proportion | J. Laboratory, proportion |

GENERAL

- | | |
|--------------------|-----------------------------|
| A. Office Expense | D. Electric Light and Power |
| B. Surface Expense | E. Rents |
| C. Pumping | |

| Ojibway Mining Company | | | | | | | | | | | |
|--|--------------|------------|--|--|--|-----------------------|--|--|-------|---------|------------|
| Daily Report for the 24 hours beginning 7. a. m. _____ 190__ | | | | | | | | | | | |
| Grade | No. of Bbls. | Net Weight | | | | | | | | | |
| | | | | | | Rock received | | | Cars | | |
| | | | | | | Coal put in bin | | | Tons | | |
| | | | | | | All heads run | | | Hours | Minutes | |
| | | | | | | Mill run | | | Hours | Minutes | |
| General tallings for | | | | | | | | | | | |
| | | | | | | Mineral shipped | | | | | |
| | | | | | | Mineral at Mill | | | | | |
| Totals | | | | | | Total Mineral to date | | | | | |
| Remarks: | | | | | | | | | | | |
| | | | | | | | | | | | Mill Supt. |

FIG. 47.—FORM 111.

The Stamp Mill accounts are made up from the time books, which contain the distribution of labor and detailed statement of supplies used.

Reports covering the operation of the Electric, Steam, and Pumping plants at the mill are similar to those employed at the mine.

A Daily Report covering the operation of the mill will be made out each day to cover 24 hours. See form 105, Fig. 45.

A Daily Supply Report (form 106, Fig. 46) covering the consumption of supplies, a record of the wear of stamp shoes, and a statement of the repairs to Heads, is made out each day by the Master Mechanic and sent to the Mill Superintendent.

A Daily Mineral Report (form 111, Fig. 47), is made out each day in duplicate; one copy will go to the mine clerk and a copy to the Mill Superintendent. Both the Mine and Mill clerks will enter these daily reports in books ruled for the purpose, showing the various grades, form 101, Fig. 48.

| MINERAL STATEMENT | | | | | | | | Month of _____ | |
|-------------------|------|-----|------|----|----|----|----|----------------|-------|
| Date | Brl. | Wk. | Hds. | #1 | #2 | #3 | #4 | | Total |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| Total | | | | | | | | | |

FIG. 48.—FORM 101.

The calendar month is divided into four periods for convenience, as follows, 1st to 7th, 8th to 14th, 15th to 21st, and 22nd to last day of the month inclusive. A Mineral Report (from 107, Fig. 49), will be made out at the end of each period, showing the mineral shipped for the period, also for the month to date, and such other information as the report calls for. Send one copy to the General Manager and one to the Superintendent.

From form 107 the General Manager makes out a report to the Head Office on form 26, Fig. 50.

17-8. Oil and Grease.

Lubricating oils
Grease
Kerosene and gasoline

Candles and Sunshine
Rope dressing
Belt dressing

17-9. Electric Supplies

Lamps
Fixtures
Wire
Meters

Motors
Transformers
Telephones
All Electrical supplies

17-10. Tools.

Machinists hand tools
Blacksmiths hand tools
Carpenters hand tools

Masons hand tools
Shovels, Picks, Hammers, Jacks, etc.

17-11. Stamp Mill.

All supplies for Mill.

18-1. Soft Coal.**18-2. Hard Coal.****18-3. Blossburg Coal.****18-4. Coke.****18-5. Family Wood.****18-6. Boiler Wood.****18-7. Stamp Mill—All fuel.**

20-1. Loss and Gain on Supplies, Adjustment.—Charge to this account:

| | |
|---------------------------------|--|
| Supply Clerks wages | Electric Light and Power proportion |
| Expense of running supply house | Expense of hauling and unloading freight |
| Heating System proportion | and fuel |

Charged off to the various classes of supplies and fuel purchased, by journal entry, from itemized statement on each invoice passing through the supply records. The charge is usually at the rate of 5 per cent. of the purchase price, to cover the cost of handling.

20-2. Manufacturing Supplies.—Charge all labor and material to this account for manufacturing supplies in the shops. Each job has a shop order number.

Credit this account and charge supplies with the cost of finished material when job is completed, this is done by journal entry.

20-3. Hoisting Ropes.—Charge new hoisting ropes to this account and pro-rate out to accounts benefited an equal proportion each month so as to close the account at the end of the calendar year. This distributes the cost of new ropes to the operating accounts evenly over a period of time, instead of having an excessive cost in any one month.

MINE BOOKS—GENERAL ACCOUNTING

The account books for the mine and mill are kept at the mine office, and consist of the following:

| | |
|----------------------------|-----------------|
| Cash book, ruled 5 columns | Voucher Record |
| Journal, ruled 3 columns | Pay-roll |
| Ledger, loose leaf | Time books |
| Side Ledger, loose leaf | Settlement book |
| Check Register | |

Cash Book, Receipts.—All cash receipts when entered in the Cash Book are classified as follows:

the first column, Treasurer.
second column, Accounts Receivable.
third column, Sundry Receipts.

The last column is used to carry the balance and extend totals.

At the end of the month summarize your receipts as follows:

| | | |
|---------------------|-------|-------|
| Treasurer | ..... | ..... |
| Accounts Receivable | ..... | ..... |
| Sundry receipts | ..... | ..... |

Cash Book, Payments.—All payments are made by check, no cash whatever being paid out, payments are posted to the Cash Book from the Check Register, according to date, and the amounts are classified under the following headings: Labor previous month, Labor current month, Bills Audited previous month, Bills Audited current month, the last column is used for totals and balance.

At the end of the month summarize your payments as follows:

| | | |
|------------------------|-------------|-------|
| Sundry Labor January | ..... | ..... |
| Sundry Labor February | ..... | ..... |
| Bills Audited January | ..... | ..... |
| Bills Audited February | ..... | ..... |
| Total Payments | ..... | ..... |
| Balance |31-19— | ..... |

The amount for the Cash Book entry covering Pay-roll checks issued on pay day is arrived at in the following manner: Deduct from the net amount of the Pay-roll for the month in question, the total amount of settlements issued against that month. Pay-roll checks issued on pay day are not entered in the Check Register.

Journal.—The first entry for the month is *Sundry Labor to Sundries* itemized which comprise deductions made on the Pay-roll which are to be credited to operating or suspense accounts. In other words it is not necessary to draw checks for them. The sum of these deductions plus the net amount of the pay-roll equals the gross amount of the time books.

The second entry is *Sundries to Sundries* itemized as follows:

Sundry Labor, pay-roll total, as per Cost Sheet page 0
Shop Accounts, total amounts, as per Cost Sheet page 6
Closed Accounts, total amounts, as per Cost Sheet page 7-7 1/2
Supplies, as per supply summary, total
Fuel, as per supply summary, total
Bills Audited, as per Voucher Record, total.

From each of the above sheets the details have been posted direct to the proper ledger account. This is a skeleton entry.

The third entry is *Sundries to Supply Adjustment Account*.

This entry is for the amounts charged to the various classifications of supplies and fuel. It is 5 per cent. of the face of the invoices that have passed through the various classifications during the month, and represent the cost of handling the supplies and feul at the mine. This information is secured from a memo. kept by the clerk showing the distribution according to the various supply classifications of the Handling Charges against each invoice passing to the supply accounts. Another memo. is kept showing the distribution of Freight and Express charges.

The fourth entry is *Sundries to Sundries* as follows:

Shop Accounts Stamp Mill total, Cost Sheet page 5
 Closed Accounts Stamp Mill total Cost Sheet page 6 1/2
 Supplies Stamp Mill total Supply Summary
 Fuel Stamp Mill total Supply Summary.

Misc. entries will follow the above.

The last entry will be General Expenditures to

| | |
|-----------------|----------------|
| Surface Expense | Development |
| Office Expense | Transportation |
| Incidentals | Stamping |
| Mining Expense | |

| | | | | | |
|---|--|--|--|--|--|
| OJIBWAY MINING COMPANY HOUGHTON, MICHIGAN | | To _____ Dr. 19____ FOR _____ | | Number _____ ACCOUNTS PAYABLE VOUCHER Ojibway Mining Company Amount, \$ _____ Favor _____ | |
| | | Received, _____ 19____, of OJIBWAY MINING COMPANY, _____ DOLLARS \$ _____ in full for the above account. | | | |
| | | The above account is correct, and the expense was incurred for the benefit of OJIBWAY MINING COMPANY Approved for payment _____ Acting Superintendent | | | |
| | | Please Date and Sign this Voucher and Return Without Delay. | | | |
| | | DO NOT DETACH PAPERS | | | |
| | | DISTRIBUTION OF CHARGES 1900 | | | |
| | | GENERAL IRON and STEEL EXPLOSIVES CEMENT, ETC. LUMBER and TIMBER MACHINERY PIPE and FITTINGS OILS and GREASE ELECTRIC TOOLS FUEL | | | |
| | | Due _____ Paid _____ Check _____ | | | |

FIG. 53.

received and all services performed during any one month are charged into that month's accounts.

Vouchers (Fig. 53) are made out in duplicate with invoices attached, and on the reverse side a distribution of the charges is shown corresponding with the entry in the Voucher Record. All Vouchers are signed by the clerk and approved by the Superintendent.

Engaging Labor.—A person seeking employment with the company will naturally apply to the foreman of the department in which he wishes to work; if the applicant is considered favorably and help is required a slip (form 22, Fig. 54) is made out by the foreman and the applicant

| | |
|---|----------------|
| Form 22-9-7-1000 | |
| To THE CLERK: | _____ 19____ |
| Dear Sir: | Book No. _____ |
| The bearer _____ | |
| has applied for a position as _____ | |
| _____ with the Ojibway Mining Co. to begin work | |
| _____ 19____ | |
| Foreman | |

FIG. 54.—FORM 22.

sent to the office with it. The clerk will fill out a Pedigree card (form 27, Fig. 55) with all information called for, and submit it to the Superin-

| | | | |
|--|--|---------------------------------|------------------|
| Name: _____ | | Occupation: _____ | Book No.: _____ |
| Place and Date of Birth _____ | | Immigrated _____ | |
| Reads, Writes, Speaks English. _____ | | Married, Single, Widower. _____ | |
| No. of Children _____ | | Sons Born _____ | |
| Names and Addresses of Nearest Relatives _____ | | | |
| Last Employed _____ | | How Long _____ | Occupation _____ |
| I hereby apply for membership under the Aid Fund and agree to abide by its rules | | | |
| Signature _____ | | Date of Application _____ | |
| Date of Employment _____ | | Date of Leaving _____ | |

FIG. 55.—FORM 27.

tendent for his approval. If the application is approved by the Superintendent the clerk will issue a numbered pay book, and also give him a copy of the Aid Fund rules. Possession of the Pay Book is authority of the foreman for putting the man to work.

The Pedigree cards are filed in a two drawer cabinet, live cards on one side, dead ones the other. Cards of rejected applicants are filed on the dead side, the card is marked rejected. When an employee resigns or is discharged, his card will be marked accordingly and placed in the dead side for future reference.

When an employee resigns or is discharged, his foreman makes out a slip (form 21, Fig. 56) requesting a settlement, which the man will present with his pay book to the timekeeper. The timekeeper will make out a settlement (form 5, Fig. 57). Earnings must be taken from the pay-roll only if for the previous month, and for the current month, from the time book. Deductions will be made for supplies or fuel, also store, board, etc. In issuing settlements, details for the current month only will be shown, for the previous month refer to the Pay-roll. When a settlement is issued the timekeeper will turn it over to the clerk.

| |
|--|
| <p>.....19.....</p> <p>To the Timekeeper:—</p> <p>Please give.....</p> <p>No....., a settlement.</p> <p>.....</p> <p>Foreman</p> |
|--|

FIG. 56.—FORM 21.

All settlements will be entered in the settlement book, Fig. 58. If an employee has time coming for two separate months, it is necessary to make a separate entry in the settlement book for each month.

Time Books and Timekeeping.—Each foreman will keep the time of his men in a pocket time book for reference. The timekeeper will keep the time in a time book ruled for 31 days, of large size. The time of all men employed above ground will be posted to the time book from the Individual Returns (form 12, Fig. 63) which each man is required to make out each day, showing what he has been doing and the time spent on the various jobs. Each foreman must O K the slips of his men before he turns them over to the timekeepers. An explanation of the Job Order system will be found under Division of Labor.

The total time represented by each slip is posted to the credit of the particular employee concerned in the office time book. The amount

of money represented by the time worked on each job is entered on the slip by the timekeeper. These amounts are based on the rate of pay for 10 hours' work. Exceptions to this rule are Engineers, Firemen, etc., also foremen on salary. Employees on a salary basis turn in 10 hours a day for each working day. After the time has been posted from the Individual Returns, they are turned over to the clerk having the Distribution of Labor in charge.

The time of all Underground employees is kept by the Shift Bosses in pocket time books, and is reported to the Timekeeper once in 24 hours.

| | | |
|--|-----------------------|------------------|
| SETTLEMENT | | 19..... |
| To the Clerk of the OJIBWAY MINING CO. | | |
|has worked on..... | | |
| at this..... days at the rate of..... | | |
| dollars (\$.....) per month | | |
| Contract..... | | |
| Not Transferable or Negotiable | TOTAL CREDIT, | |
| | DEDUCTIONS, | |
| | Supplies \$..... | |
| | Fuel | |
| | Doctor and Club | |
| | Board Bill | |
| Store | | |
| | | AMOUNT DUE |

FIG. 57.—FORM 5.

As miners actually work only five shifts a week, the following rule will be observed in giving them time. A miner who works five shifts in a week will be given credit for six shifts. Miners who do not work the five shifts in a week will receive credit only for the time actually worked.

The timekeeper will classify the labor in the time book in the following order:

- | | |
|--|---------------------|
| × Captains and Shift Bosses | Landers Surface |
| Miners Company Account | Landers Underground |
| × Miners Contract—each contract separate | × Engine boys |
| × Selectors | Pumpmen |
| × Blockholers | Pipemen |
| × Wallers | Timbermen |
| Trammers | × Change house men |
| Track repairers | × Sprinkler |

Space must be allowed to show a Distribution of Labor of all the above classifications in the time book except those marked thus, ×, which are not distributed.

| Earnings | | Deductions | |
|------------|------|------------|---------------------|
| | Days | Amount | Amount |
| Time Book, | xxxx | xxxxx | Rent, xxx |
| Office, | xxx | xxx | Supplies, xxx |
| Doctor, | | xxx | Fuel, xxx |
| Board, | | xxx | Doctor, xxx |
| Store, | | xxx | Aid Fund, xxx |
| | | | Office Fees, xx |
| | | | Electric Light, xxx |
| | | | Board, xxx |
| | | | Store, xxx |
| Total, | xxxx | xxxxxxx | Total, xxx |

(Envelope)

No.

In Account With
OJIBWAY MINING CO.

| | | | | | | | | | |
|--------------|--------------|--|--|--|--|--|--|--|--|
| CR. By | Days | | | | | | | | |
| " | Days | | | | | | | | |
| " | Contract | | | | | | | | |
| " | Board Bill | | | | | | | | |
| " | Club | | | | | | | | |
| " | | | | | | | | | |
| DR. To Labor | Days | | | | | | | | |
| " | Rent | | | | | | | | |
| " | Supplies | | | | | | | | |
| " | Wood | | | | | | | | |
| " | Coal | | | | | | | | |
| " | Club & Phys. | | | | | | | | |
| " | Board | | | | | | | | |
| " | Store | | | | | | | | |
| " | | | | | | | | | |
| " | | | | | | | | | |
| BALANCE DUE | | | | | | | | | |

FIG. 60.—FORM 4.

It is well to have pay Dockets (form 4, Fig. 60) written as soon as the Pay-roll is completed.

Pay checks should be written the day before pay day, assigned accounts removed, etc. On pay day the dockets should be delivered only to the individual in whose name they are made out, on presentation on pay book with the receipt (Fig. 61) properly signed for the month in question. Dockets will not be delivered to parties other than those in

whose name they appear, only when an order to that effect properly signed and accompanied by the pay book receipt, also properly signed, is presented at the mine office.

This leaf must not be torn off by owner of Book

Received of

OJIBWAY MINING CO.

Balance Due for labor in

JANUARY, 19.....

Number _____

Write Name here before presenting Book at Pay-Window

FIG. 61.

Distribution of Labor.—The Shift Bosses will report each day to the timekeeper, when they report their time, a distribution of labor for all their classifications except,

Captains and Shift Bosses, Miners contract,
Change House men, Selectors, Blockholders
Sprinkler, Wallers, Engine boys.

This distribution should show for each classification the number of shifts worked in each opening. To illustrate, suppose we have 20 Selectors:

| | | | |
|------------------------|---------|---|----|
| 1 shaft | 3N-mill | 4 | 3 |
| 1 | 4S | 3 | 2 |
| 1 | 4N | 2 | 4 |
| 2 | 3S | 3 | 3 |
| 2 | 4N | 4 | 4 |
| Rockhouse No. 1 | | | 2 |
| Tramming No. 1-3N-mill | 4 | 1 | |
| Tramming No. 2-4N | 4 | 1 | |
| | | | 20 |

which is the total of Selectors as shown by the time book for the day in question. The same idea applies to all the other classifications of labor underground. The timekeeper will show these classifications of labor in his time book immediately following their time.

Distribution of Labor above Ground.—These classifications are as follows:

| | |
|------------|-------------------|
| Surface | Blacksmiths |
| Teaming | Electricians |
| Carpenters | Engineering Dept. |
| Machinists | Masons |

The distribution of the above classes of labor is made to Job Orders by Individual Returns, Fig. 63.

Engineers—may have to distribute to different plants
 Firemen—seldom any distribution
 Pumping—Watersupply—seldom any distribution
 Rockhouse men—keep different houses separate.

Whenever any distribution is necessary for the above four classes, they will be kept in the time book.

Job Orders.—In an effort to get an efficient and comprehensive cost keeping system the job order method is used, comprising the following forms:

Form 12. Individual Returns
 Form 35-A. Job Order issued to foreman
 Form 35-B. Job Record, office record
 Form 47. Job and Equip. Record, an index to jobs.

| OJIBWAY MINING COMPANY | |
|---|--------|
| MECHANICAL DEPARTMENT | |
| Job No. 1346 | |
| DATE..... | |
| BLUE PRINT | SKETCH |
| Time and Supplies Must be Charged to Job Number. | |
| Description of Work: | |
| | |
| | |
| | |
| Return Duplicate when Job is finished. MASTER MECHANIC. | |

FIG. 62.—FORM 35-A.

It is well to have the Master Mechanic or his assistant issue job orders as the majority of jobs above ground come under the supervision of the mechanical department. A Job Order will run for a month only (except that jobs covering the manufacture of supplies, will run until the job is completed). If a job is not completed at the end of the month a new job will be issued the first of the month to cover the work, etc., until completed.

Job Orders, Fig. 62, can be issued so as to get as much detail as is

required. Of course, the more detail, the more jobs it is necessary to issue and more time is required to take care of the office work in connection with the system.

A list of the job orders issued each month will be posted up in each of the shops and at the supply house for reference, this should be attended to by the timekeeper on his rounds twice a day. The Job Orders are issued in duplicate, the original going to the mine office, and the duplicate to the foreman having the work in hand.

Employees working on jobs will show on their Individual Return, the Job number and the number of hours worked on the job, this applies to as many jobs as he may work on in a day. As stated under time-keeping, these slips reach the timekeeper through the various foremen. The timekeeper will then extend opposite the various jobs the amount of money, based on the man's day rate of pay.

| INDIVIDUAL RETURN | | Date | |
|--|----------------|-----------------|------|
| BOOK NO..... | | NAME..... | |
| JOB | NATURE OF WORK | HRS. | COST |
| | | | |
| | | | |
| | | | |
| | | | |
| This is authority for employee's time. | | FOREMAN'S O. K. | |

FIG. 63.—FORM 12.

From the Job Order the clerk or his assistant will make out a Job Record (Fig. 64) noting the Job number, the work it covers, and will also show to what account the work is to be charged. When jobs are completed they are indexed on 5×8 cards like the following (Fig. 65). This card answers two purposes. First as an index to jobs and second to show details of Equipment. Regarding equipment the card would show the item, which might be a Motor, Boiler, Compressor, Air Drill, etc., and the details, also From whom bought, Voucher number, Cost, Freight, Handling. Charged to what account and when. To illustrate the use of the card, if we had a job to repair Compressor No. 1 and were indexing,

[illegible]

FIG. 64.—FORM 35-B.

turn to Compressor No. 1 card in the file, post the job number, the month and the cost of the job.

All Equipment should be indexed on these cards for ready reference.

The Job Records are made up at the end of the month, and as soon as the books are balanced and cost sheets are made out the shop expense and supplies can be posted to the Job Records to make them complete before indexing. Before the books can be made up it is necessary to transfer the jobs to Division of Labor sheets (a sheet for each shop) these sheets have the following headings:

ACCOUNT NUMBER, ACCOUNT, TIME, TOTAL COST, LABOR, EXPENSE,
JOB NO., REMARKS.

[illegible]

FIG. 65.—FORM 47.

First enter the Account number, then the Account to which the job is to be charged, then the Time, next the Labor, Job number, and last under Remarks state what the work was, as Sharpening Drills for No. 1 shaft.

When all the Labor sheets are made out we are now ready to close the accounts and find the expense to apportion against the different jobs. The expenses of the different departments are apportioned to the jobs of that department according to the amount of the labor charge.

Close out the accounts in the following order, Surface, Teaming, Carpenters, Machinists, Blacksmiths, Electricians, Engineering Dept. and Masons. From these labor sheets post the expense to the different job records for the month, and from the Supply records, the Supplies and the Job Records will be complete.

Supply Department. The Purchase of Supplies.—To facilitate the ordering of supplies the heads of the various departments are furnished with Department Requisitions, form 14-A, Fig. 66, as shown below.

No.

Order for

From Req. No.

..... Date

| Amt. | DESCRIPTION | STOCK | CHARGEABLE TO |
|------|-------------|-------|---------------|
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

..... Foreman.

FIG. 66.—FORM 14-A.

[illegible]

FIG. 67.—FORM 2.

The heads of departments will order supplies on these forms for specific jobs, and only such material as is not carried regularly in stock in the warehouse. They must be signed by the foreman issuing the same and turned over to the Mine Clerk; they will also be approved by the Superintendent before being ordered by the clerk.

Requisitions on Purchasing Agent.—These requisitions (form 2, Fig. 67) are made out in duplicate by the Mine Clerk, either for the purpose of filling depleted warehouse stock, or specific jobs as per Department Requisitions, and must have the approval of the Superintendent before going to the Purchasing Agent. If supplies are ordered from a Department Requisition, its number should be noted, also the foreman's initials at the top as reference. The original copy goes to the purchasing agent and the duplicate on file.

Form 14-3 M-1-10

No.

Order for.....

From.....

Order No.

Date.....

| Amt. | Req. | Description | List | Dis. | Net |
|------|------|-------------|------|------|-----|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

Ship

FIG. 68.—FORM 14-B.

Office Orders.—To handle the work in the purchasing office to the best advantage, the purchasing agent makes out from the Requisition, Office Orders (form 14-B, Fig. 68) which are turned over to the stenographer to execute. The Requisition number is shown on the Office Order for reference.

Purchase Orders.—These orders (form 1, Fig. 69) are made out in triplicate by the stenographer, from Office Orders. Original copy goes to the Vendor, Duplicate copy to the files, Triplicate copy to the mine office.

The numbers representing the different classes of supplies. Each invoice is checked off against the Purchase Order. The items on the order being checked off and the price noted thereon, also the date of the invoice, terms of payment and the F. O. B. point. The price should now be checked either against quotation received or prices previously paid for the same goods. Extensions and footings must be verified and cash discounts figured. All invoices after being checked should be entered on the Price Record cards (form 8, Fig. 72). A separate card being used for each item or kind of article purchased, Fig. 72, form 8-5×8.

| Article | | | | | | | | Unit | Wt. | Class. |
|---------|------|-------|----------|-------|----------|-------|--------|---------|-----|--------|
| DATE | FIRM | ORDER | QUANTITY | PRICE | DISCOUNT | TERMS | F.O.B. | REMARKS | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

FIG. 72.—FORM 8.

These cards furnish a complete record to the Purchasing Agent of prices paid and quantities purchased.

Invoices should be forwarded to the mine office each day, and when received by the clerk, the duplicate placed on file and the original turned over to the supply clerk.

The supply clerk will check the invoices against the triplicate copy of Purchase Order. When material received is checked off, he will also show against each item on the invoice, its proper proportion of the freight charges on the shipment, and also to each item 5 per cent. of its cost to cover the expense of handling. The supply clerk will O. K. all invoices for receipt of material and they will have to be approved by the Superintendent before being paid.

Cash discounts should be taken in every instance. Pay all invoices (except discounted ones) on the 15th of the month following receipt of goods or performance of services.

Stock Record Cards.—For the purpose of keeping an accurate account at the mine of all supplies purchased and also used, form 7, Fig. 73, is an example of the card system used. The supply clerk will keep a separate card for each article or kind of material bought. From each invoice received each item will be entered on its proper card, showing date of invoice, Purchase order number, Quantity, Invoice cost, Handling, Freight, and Total Cost. The price at which articles will be charged out, is arrived at by dividing the total cost by the quantity received. All supplies charged out will be entered on the proper cards by the supply

clerk, from the supply orders (form 3, Fig. 75), showing Date of charge, Account chargeable, Quantity and Amount.

At the end of the month after all invoices and supply orders have been entered on the cards for the month, the cards should be balanced, and the quantity on hand and value brought down as of the first of the month. From this balance of quantity a value will be figured, the new charging price for the coming month.

| Article | | | | | | | Classification | | | | |
|---------|-----------|-------|------|--------|--------|--------|----------------|---------|-------|-------|--------|
| DATE | CONSIGNOR | QUAN. | COST | HAND'G | FIGHT. | AMOUNT | DATE | ACCOUNT | QUAN. | PRICE | AMOUNT |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

FIG. 73.—FORM 7.

These cards should be filed in alphabetical order, with subguides for the various kinds of material. For instance, Bolts would come under the letter B, and separate guides should be provided for each kind of bolts.

The Purchasing Agent keeps a duplicate record of all supplies purchased and used or sold. This record can be kept as a loose leaf book to advantage. It is kept primarily as a guard against fire and the loss of the mine records, it also serves as a check on the supply clerk. A copy of this sheet (form 39, Fig. 74) is shown.

Supplies Used Record.—Supplies will be issued by the Mine Clerk only on presentation of a "Supply Order" (Fig. 75) properly signed by the head of the department ordering the same, or such persons as are authorized by the Superintendent to sign Supply Orders. From day to day these orders should be entered on the Supply Stock cards, and at the same time the entry is made, the value of the quantity of goods being charged out should be noted on the Supply Order.

There will arise at different times cases where supplies that have been charged out, have served their purpose and are not required on the job they were originally charged to, but are removed and are in condition to be used for some other purpose. To meet this condition we use a Credit Slip (form 38, Fig. 76), giving the job the supplies were originally charged to credit, and charging the material back into the supply account. Or in a case where material is removed from one job to be used on another, the first job would receive credit and the charge would be to the second one.

[illegible]

FIG. 74.—FORM 39.

| Amount Ordered | | Value | Chargeable to |
|----------------|--|-------|---------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Use for charges against one account only _____ Foreman
This requisition, properly signed, must be filed in the Clerk's office.

FIG. 75.—FORM 3.

Concrete work is an instance where lumber is used for forms and is removed when the concrete is set. A large part of this lumber is in condition to be used again for other purposes and credit should be given the job it was charged to, and the lumber charged back into the supply account at such a price as it would be worth in future work. They are handled the same as Supply Orders.

OJIBWAY MINING COMPANY CREDIT SLIP No.

SUPPLY CLERK: 190

| Amount | | Value | Credit |
|--------|--|-------|--------|
| | | | |
| | | | |
| | | | |

.....

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |

Charge to

..... Foreman

This requisition, properly signed, must be filed in the Clerk's office.

FIG. 76.—FORM 38.

OJIBWAY MINING COMPANY
OJIBWAY, MICH.

No.

DAILY REPORT

For the 24 hours beginning at 7 a. m. 19....

| ROCK HOISTED | | | SHIPPED | | |
|--------------|-------|-------|---------|------|------|
| Good | Waste | Total | Rock | Cars | Mass |
| Skips | | | | | |
| Tons | | | | Tons | |

Coal Used Tons Wood Used

DRILLS AT WORK

| | | | | | | |
|-----------|-----------|----------|---------|--------|--------|-------|
| Sinking 1 | Sinking 2 | Drifting | Stoping | Raises | Winzes | Other |
| | | | | | | |

MEN AT WORK

| Surface Department | Underground Department |
|-----------------------------|------------------------|
| Surface Foreman | Captain |
| " Labor | Shift Bosses |
| Watchman | Trammer Bosses |
| Janitor | Miners |
| Carpenter Foreman | Drifting |
| Carpenters | Cross-cutting |
| Master Mechanic | Drift on Pillars |
| Machinists | Drift Stopping |
| Blacksmiths | Stoping |
| Masons | Blasting Side |
| Electricians | Raises |
| Engineering Dept. | Winzes |
| | Sinking |
| Engineers | Timbermen |
| Firemen | Trammers |
| Pumpmen | Muckers |
| | Landers |
| Rock House | Waller |
| Foremen | Pumpmen |
| Laborers | Pipemen |
| Landers | Pony Boys |
| Clerk and Assistant, Office | Drill Boys |
| Timekeeper | Dry Men |
| Supply Clerk | |
| | Total Underground |
| | Add Surface |
| | Total |

Teams
Co. Teams Timekeeper.

FIG. 79.—FORM 15.

rate to which should be added an amount sufficiently large to cover the cost of loading and unloading.

Reports.—A Daily Report (form 15, Fig. 79) is made out each day by the timekeeper and sent to the Superintendent. This report shows the men at work under the different labor classifications, the Drill at work, Fuel used, and Rock hoisted and shipped.

No.

OJIBWAY MINING COMPANY

ACCIDENT REPORT

- Name of Person Injured Shaft No. Pay Book
- Kind of work in which he was employed and where working at time of accident

- Who was in immediate charge of the work?
- Day and hour when accident occurred M 19....
- Were you present? Give your position with reference to person injured
- Names and addresses of all witnesses and persons in vicinity whether employees or not:

| Name | Occupation | P. O. Address |
|------|------------|---------------|
| | | |
| | | |
| | | |
| | | |

- Statements of witnesses

- Statement of remarks of injured person. Does he blame any other than himself?

Reported by

Dated at
Occupation

If Superintendent, Mining Captain, Foreman,
Shift Boss or witness, so state.

FIG. 80.—FORM 37.

| COMPARATIVE COSTS Month of | | | | |
|--|--------|--|--------------------|------------------------------|
| Total Men employed..... | | Men employed underground | | |
| | Amount | Total cost per man | Cost per man U. G. | Total Expense |
| Surface | | | | |
| Office | | | | |
| Incidental | | | | |
| Transportation | | | | |
| Stamping | | | | Surface accounts \$..... |
| Miners labor | | | | |
| Miners supplies | | | | |
| Compressor | | | | |
| Air Lines | | | | |
| Power Drills | | | | |
| Gen. U. G. Expense | | | | |
| Pumping U. G. | | | | |
| Timbering | | | | |
| Tramming | | | | |
| U. G. Cars | | | | |
| U. G. Tracks | | | | |
| Hoisting | | | | |
| Rock house | | | | U. G. accounts \$..... |
| Construction | | | | Construction \$..... |
| | | | | Total Expenditure \$..... |
| Total Expenditure = \$..... per month. | | Total Expenditure = \$..... per month. | | |
| Total Men | | Men Underground | | |

Fig. 83.

| Summary of Labor as Per Pay Roll. Month of | | | | | | | | | | | | | | |
|--|--------|----------|-----------|-------------|-------|---------|-------|--------|-------|--------|------|--------|------|--------|
| | MINERS | TRAMMERS | TIMBERMEN | BLACKSMITHS | MISC. | FARMERS | SHOPS | OFFICE | TOTAL | Ledge | | | | |
| | Days | Amount | Days | Amount | Days | Amount | Days | Amount | Days | Amount | Days | Amount | Days | Amount |
| 7-1 | | | | | | | | | | | | | | |
| 7-2 | | | | | | | | | | | | | | |
| 8-1 | | | | | | | | | | | | | | |
| 8-2 | | | | | | | | | | | | | | |
| 8-3 | | | | | | | | | | | | | | |
| 8-4 | | | | | | | | | | | | | | |
| 8-5 | | | | | | | | | | | | | | |
| 8-6 | | | | | | | | | | | | | | |
| 8-7 | | | | | | | | | | | | | | |
| 8-8 | | | | | | | | | | | | | | |
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| 8-10 | | | | | | | | | | | | | | |
| 8-11 | | | | | | | | | | | | | | |
| 8-12 | | | | | | | | | | | | | | |
| 8-13 | | | | | | | | | | | | | | |
| 8-14 | | | | | | | | | | | | | | |
| 8-15 | | | | | | | | | | | | | | |
| 8-16 | | | | | | | | | | | | | | |
| 8-17 | | | | | | | | | | | | | | |
| 8-18 | | | | | | | | | | | | | | |
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| 8-96 | | | | | | | | | | | | | | |
| 8-97 | | | | | | | | | | | | | | |
| 8-98 | | | | | | | | | | | | | | |
| 8-99 | | | | | | | | | | | | | | |
| 8-100 | | | | | | | | | | | | | | |

Fig. 84.

[illegible]

FIG. 91.

[illegible]

FIG. 92.

[illegible]

Fig. 93.

[illegible]

Fig. 94.

[illegible]

FIG' 95.

[illegible]

FIG. 96.

a mine consisting of a series of irregular ore shoots in a fractured and dislocated country the amount of geological work is necessarily quite large.

Of course this matter of keeping track of details can be carried to an extreme, and might possibly become more of a detriment than an aid, were it not that the graphic method soon indicated the important points to watch in each operation and what details may well be omitted as the system is extended.

In order to keep the graphic records it is necessary for several men to collect the data that is used in preparing them. To render this easier and to simplify the work as well as to have the records uniform, practically everything is recorded on printed forms.

MINE LEDGERS—OPERATING ACCOUNTS

| Expense Accounts | Distributed Accounts | |
|---------------------------|----------------------|-----------------|
| | Closed Accounts | Shop Accounts |
| Exploring | Boilers | Machine Shop |
| Development | Compressor | Blacksmith Shop |
| Shafts and Tunnels | Electric Lights | Carpenter Shop |
| Stoping | Heating | |
| Tramming | Fuel | |
| Hoisting | Explosives | |
| Pumping | Lumber and Timber | |
| Timbering | Teaming Timber | |
| Cars and Tracks | Supplies | |
| Operating Tramway | Surface Waste | |
| New Tramway | General Office | |
| Machinery | | |
| Laboratory and Eng. Dept. | | |
| Surface Expense | | |
| Buildings and Fixtures | | |
| General Expense | | |

Exploring.—This account is intended to cover all cost, including labor and supplies incident to exploring new ground.

Development.—This account is intended to cover all cost including labor and supplies incident to the development of known ore bodies.

Shafts and Tunnels.—This account is intended to cover all cost, including labor and supplies, in the sinking of new shafts and the driving of new drifts.

Stoping.—This account is intended to cover the total cost including labor and supplies of breaking ore in stopes.

Tramming.—This account is intended to cover all cost including labor, supplies and power, for tramming by hand and by power.

Hoisting.—This account is intended to cover all cost including labor, supplies and power, to operate and maintain both engine houses, hoists, pulley stands, etc.

Pumping.—This account is intended to cover all cost including labor supplies and power, to operate and maintain all pumps and water lines underground.

Timbering.—This account is intended to cover all cost of handling, framing and placing in the mine all timber used underground. It does not include the cost of the timber used.

Cars and Tracks.—This account is intended to cover the cost and installation of new cars and permanent track, but does not include the cost of replacing old cars with new ones.

Operating Tramway.—This account is intended to cover all cost including labor and supplies of operating and maintaining the tramway.

New Tramway.—This account is intended to cover all cost including labor and supplies of building new tramways and trestles, but not repairs to old ones.

Machinery.—This account is intended to cover all cost including labor and supplies to cover the purchase and installation of new machinery.

Laboratory and Eng. Dept.—This account is intended to cover all cost including labor and supplies for running the laboratory and doing all engineering work.

Surface Expense.—This account is intended to cover all cost including labor and supplies of odd jobs about the property that cannot legitimately be charged to other operating accounts.

Buildings and Fixtures.—This account is intended to cover all cost of new buildings and fixtures, but does not include the upkeep of old buildings.

General Expense.—This account is intended to cover all cost of odd jobs underground.

Boilers.—This account is intended to cover the cost of operating and maintaining the boiler plant. It is closed out each month to the various accounts benefited on a basis of horse power used.

Compressor.—This account is intended to cover the cost of operating and maintaining the compressor plant. It is closed out each month to the various accounts benefited on a basis of quantity of air used.

Electric Lights.—This account is intended to cover the cost of operating and maintaining the electric generating plant. It is closed out to the various accounts benefited on a basis of current used.

Heating.—This account is intended to cover all cost of operating and

maintaining the heating plant. It is closed out each month to the various accounts benefited.

Fuel.—This account is intended to cover all cost of coal including freight and unloading charges. It is closed out to the accounts benefited on a basis of tons used.

Explosives.—This account is intended to cover the cost of explosives and is closed out each month on a basis of power used.

Lumber and Timber.—This account is intended to cover the cost of Lumber and Timber also wedges and mine ladders used. It is closed out each month to the various accounts benefited according to the cost of supplies used.

Teaming Timber.—This account is intended to cover the cost of teaming timber to the mine shafts. Labor charges only. It is closed out each month to the various accounts benefited on a basis of supplies used.

Supplies.—This account is intended to cover the cost of all supplies used not otherwise provided for and is closed out each month to the various accounts benefited according to the cost of supplies used.

Surface Waste.—This account is intended to cover all cost of filling stopes from surface waste. The whole account is closed into stoping.

General Office.—This account is intended to cover all cost and expense covering the Office and Superintendence.

All these accounts are further itemized; for instance, the Stopping account is subdivided as follows: Labor, Supplies, 3-B Rand parts, 2 1/4 in. Rand parts, 2 1/4 in. Sullivan parts, 0-D Rand parts, total of all the above supplies. All these are apportioned from the storehouse account. Powder 1 1/4 in. 30 per cent., 1 1/4 in. 40 per cent., and 1 in. 30 per cent., fuse, caps, all are apportioned from the powder account. Next comes lumber and timber, portion used in stopes. Then comes the shops and compressor items, under which are charged the proportion from these accounts. Timbering and Surface Waste items cover the cost of putting in timbers and filling the stopes with surface waste, respectively, and are charged directly to stoping and are not distributed accounts.

The total tons mined and the total cost of stoping are figured, and then from these the cost per ton calculated.

Tonnage and Labor Chart.—The most important graphic record is the tonnage and labor chart which is posted in the main office where every one can see it and where it is studied by the shift bosses, the foremen and the other mine officials. On this labor chart in plotting the tonnage a scale of 100 tons to an inch vertically is used, while the days are plotted at intervals of an inch. This plotting is done on 10 scale paper. This scale is good for the Highland Boy Mine, where the tonnage for a day does not fluctuate more than 200 tons. A curve is plotted for the day shift tonnage and also one for the night shift, then the total tonnage for

the two shifts is plotted and also the total tonnage sent over the tramway. This tramway tonnage, as has been said before, is the most accurate of all tonnages. The tonnage mined is plotted from the estimated weight of a car of ore and the number of cars sent out by that shift. At first there were large variations between the mine tonnage and the tramway tonnage. Now the mine tonnage and the tramway tonnage are quite close together, rarely differing more than 50 tons in a daily output of 800 tons. The fact that this report made the men load the cars full has more than paid for the trouble in keeping the reports. Pay day and delays are shown by the corresponding sags in the tonnage lines.

Below the tonnage lines and on the same chart are plotted the number of machines working each day. In doing this a vertical scale of five machines to the inch is used. Curves to represent the total number of machines in use, the machines in ore and the machines on waste are plotted. Below this are plotted the labor figures. The scale used is ten men to the inch. Curves are plotted for the total men employed and the total men employed underground. At the bottom is plotted the tons per man curve. These are on a scale of 1/2 ton to an inch vertically. One curve shows the tons mined per man underground and another the tons mined per man employed about the mine both above and below ground. A scale of one ton to an inch was tried, but this was found to be too small a scale to show variation sufficiently striking.

On this tonnage and labor chart the most important figures in mining are clearly shown so that every one can readily see how efficient the work at the mine is.

Probably there is no better way to get cheap costs than to keep such a labor chart. It shows the efficiency in a department which includes 60 per cent. of the total cost of mining. There is only one other curve which might well be added at square set and stull timbered mines. This is a curve showing the number of men on the timber gang. Probably there is no work about a mine where more loafing is done than on the timber gang.

Such a curve in square set mining would also show whether the filling was being kept up with the stoping, for when it lagged behind, the timberman curve would mount as bulkheads became necessary.

Other Graphic Records.—In a number 376 Keuffel and Esser cross-section book, graphic records of most of the principal items in the accounts are kept. These include Cost per ton, Amount of the straight accounts, Distributed accounts, Actual total tonnage for each month, Actual average tonnage for each day for each month, Actual average tons mined per day per man employed, The same per man underground, Average number of laborers of each class per day for the month, The average of the total men employed per day for the month, the same figure for

Miscellaneous labor and also for Underground labor. Other curves are plotted for the average number of machines in ore, in waste, and the average number of all machines drilling.

In order to check the mine assaying and sampling, curves are plotted for the assays and analysis of the smelter pulp, ore bin samples (grab samples from tram buckets), and the average of all facesamples. These generally check quite closely. The sum total of the net debits is plotted and also curves showing the cost per hole drilled by machines, cost per shift, cost per machine, holes drilled per shift, and other data from the monthly machine drill reports.

From these curves by comparing them with other months the officials can tell at a glance how the work in different departments compares with the work for other months. The manager can see at a glance exactly what part of the work needs watching and in case of any extraordinary figures can tell exactly where to look for the disconcerting data without wading through a whole mass of figures and reports. The graphic method of recording the different data increases the value of the cost and data keeping work fully twofold and probably no money spent by the company brings in, of course indirectly, greater returns than that spent in plotting the different data.

Blasting Report.—At the mine special provision is made underground to safeguard the men, especially from blasting accidents which, after falls of ground, are the most numerous accidents in metal mines. This Blasting Report (Fig. 112) shows the number of missed holes and their position while a blue print report, on which is marked the places that are dangerous, owing to approaching work, is also used. The headings of this report are given in an accompanying form.

Posted throughout the mine at these places are white painted sign boards on which in black letters is the warning "Dangerous from approaching working." While many of the workmen are foreigners who cannot read English, they soon find out the meaning of these white signs. Possibly a death head and cross bones might give a more vivid warning to any one whether he could read the sign or not.

All development and exploratory work at the Highland Boy is contracted that can be. Often by placing the price just high enough so that the machine helpers will have to aid in running the cars in order that the men can make good wages, the cost of the work can be made considerably less than by days pay, for the machine helper on days pay will only tend chuck and an extra mucker would have to be paid.

Contract Curves.—In order to facilitate the setting of contract prices and to aid in judging whether contract work will pay compared with days pay these curves have been worked out. These curves are plotted in No. 376 K, and E, cross-section books in which the paper is ruled to

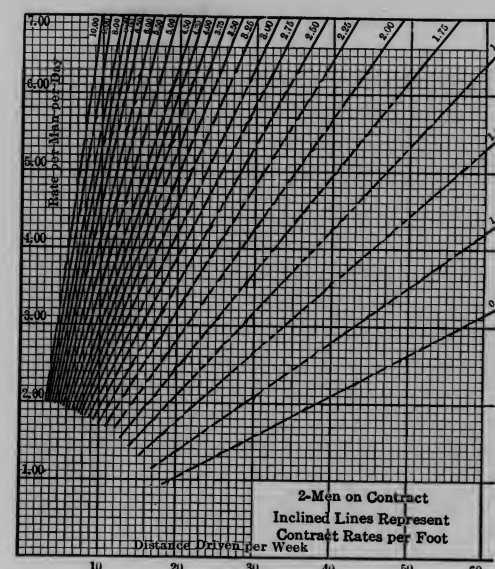


FIG. 98.

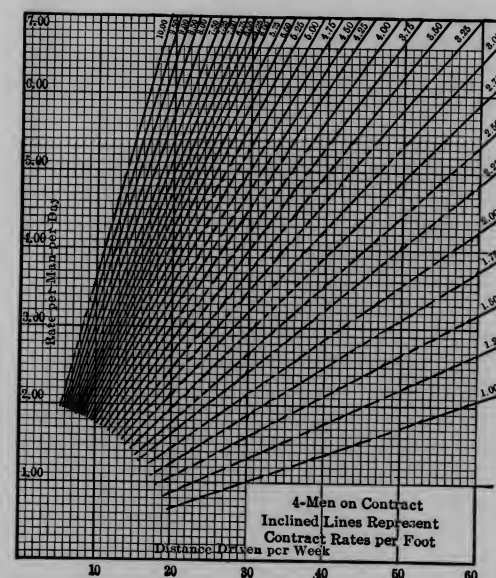


FIG. 99.

tenths. The first set that applies to contract work are applicable to any camp, but those that apply to the days pay work of course are only applicable to camps where the Bingham scale of wages are paid. Consequently only two of the curves are shown, Figs. 98 and 99.

On the contract labor chart the scale is \$1.00 to an inch vertically, and 10 ft. to an inch horizontally. The horizontal distance represents the number of feet driven in a week, while the vertical scale represents the amount of money each man on the contract is earning a day. In

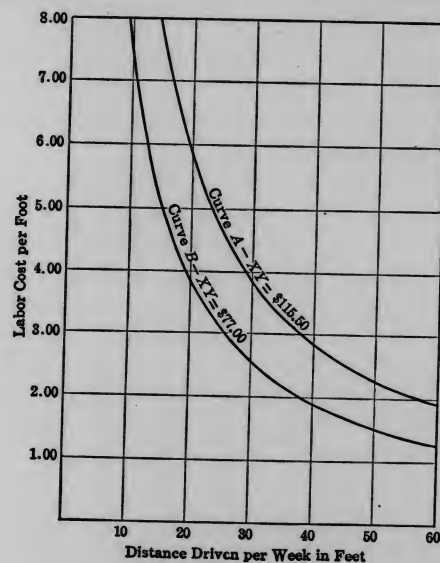


FIG. 100.

plotting these curves we have the equation that $ny = mx$, where y is the wage earned by each man a day, x is number of feet driven in a week, m is a constant, the price paid per foot, and n is the number of man shifts worked during a week. This equation is of the first degree and is therefore represented by a straight line.

Consequently in plotting the different lines on these diagrams the greatest distance that is represented is assumed to be the distance driven. This distance and the price paid per foot are multiplied together and then divided by seven times the number of men working on the contract. This gives the wage that each man would earn each day had that distance been driven. Upon plotting this rate as an ordinate, or vertical distance, and an assumed distance driven a week as abscissa, or

horizontal distance, and connecting the point thus obtained with the origin by a straight line, you have a curve which represents all the conditions when that rate per foot is paid.

This curve is useful in many ways. It can be used to tell at a glance what the men are earning from the rate of progress that they are making. Or in setting the contract it can be used to fix the price per foot when one decided how much the men should drive or raise in a week in that rock and what wage the men should be allowed to make a day.

The Pay Day Curves.—The pay day curves are plotted with the cost of labor per foot as verticals or ordinates and the distance driven per week as horizontals or abscissæ. The formula for these curves is $XY = M$, where M is the constant, representing the wages earned in a week by the crew in question, Y is the cost of labor per foot and X is the distance in feet driven per week. This equation is that of a parabola, Fig. 100.

The curve is most easily plotted by means of the slide rule and dividing the constant sum by either the assumed distance driven per week, or the assumed cost of labor per foot. The first is the better way as the quotient is the price per foot, and as a tenth-scale paper is used the decimals can easily be plotted. As to the two curves shown, the first XY equals \$115.50, represents the conditions when two machine men, two helpers and two muckers are working in a drift on the two shifts. It is figured as follows:

| | | |
|---------------|-------------------------|---------|
| 2 Machine men | @\$3.00, 7 shifts each, | \$42.00 |
| 2 Helpers | @\$2.75, 7 shifts each, | 38.50 |
| 2 Muckers | @\$2.50, 7 shifts each, | 35.00 |

Total, \$115.00

Presuming 60 ft. to be driven a week, then the price per foot is \$1.92. The second curve, XY , equals \$77.00, represents a crew of two machine men and two muckers.

The pay day curves are useful in telling at a glance the approximate cost of the labor per foot at the rate the drift is being driven a week and whether it is better to contract the drift. You can also tell how far a contractor would have to drive at any price per foot to make a days pay. All these curves apply to any kind of lineal advance, whether it is raising, drifting or shaft sinking. The curves are great aids and have been found very useful.

Blasting Report (Form 1, Fig. 101).—At the Highland Boy mine there are two bosses on shift. These make out their reports together. One of these reports is called the Blasting Report. An accompanying form shows the different headings on this report sheet. This report is made out mainly to give information to the other shift as to the missed holes and what is required at each working place.

| UTAH CONSOLIDATED MINING COMPANY. BLASTING REPORT | | | | | | | | | |
|---|---------------|-----------------|------------------|---------------------------|---|---------------------------|------|-------|--|
| Blasting Done on Shift | | | | | Remarks: If blasting is not done at time specified by superintendent state reason why. If blasting is done at any other time than that specified by superintendent, state why. If there has been a change in the weight of the powder used, state the weight report the same in the column opposite the proper working place. Report anything in this column not covered by the others. | | | | |
| Level | Working Place | Machine Drills | Hand Work | No. Missed holes reported | Ready for Timber Track | Ready for pipeman needed? | Date | Shift | |
| | | Number Blasting | Time of Blasting | Men Blasting | | | | | |
| | | | | | | | | | |

| UTAH CONSOLIDATED MINING COMPANY. SHIFT FOREMAN REPORT | | | | | | | | | |
|--|-----------|-----------------|--------|---------|----------|-----------|-------------------|------|-------|
| Working Place | Machiners | Machine helpers | Miners | Muckers | Trammers | Timbermen | Timberman helpers | Date | Shift |
| | | | | | | | | | |

| UTAH CONSOLIDATED MINING COMPANY. POWDER REPORT | | | | | | | | | | | | | | | | |
|---|-----|------------|--------------------------|----------------------------|---------------|-------|-------------|-------|-------------|-------|------------------------|-------------------------|-------------------------|--|----------|-------|
| Receiver of Powder | No. | Occupation | Number of Machine Drills | Where Powder is to be used | Class of Work | | | | | | Number of Fuses Issued | Length of Fuses in feet | Strength of powder used | Remarks: Enter in this column the amount of all powder and fuse returned to magazine, and any other information not covered by previous columns. | | |
| | | | | | Big | | Small | | Hand | | | | | | Blasting | Holes |
| | | | | | Sticks used | Holes | Sticks used | Holes | Sticks used | Holes | | | | | | |
| | | | | | | | | | | | | | | | | |

FIG. 101.

FIG. 102.

FIG. 103.

Shift Foreman Report (Form 2, Fig. 102).

—The shift bosses together also make out the Shift Foreman's report, the headings of which are given in an accompanying form. This report is merely a labor report and is used to check the timekeeper who goes through the mine during the first part of each shift in order to check up the places where the men are working so that he can distribute the labor expense properly to the different items in the monthly report. The labor sheet is also used in making up the labor and tonnage chart which is described in the fore part of this article. These are the two principal reports, but special requirements have necessitated others.

Powder Report (Form 3, Fig. 103).—The company decided to keep track of the powder and fuse issued to each man. So powder magazines were constructed in different parts of the mine. These are supplied with dynamite and capped fuse by the powder monkey, and they are kept locked. The key is given to some one working in that part of the mine, generally a timberman and less often a miner. This man comes to the magazine an hour before blasting time and unlocks the magazine he is appointed to care for. Then he gives out dynamite and fuse and records the number of the man, the place that the man is working, the sticks of dynamite and the grade, the number of holes drilled, the number of the machine and other data on the form that is called for. This Powder report is used in several different ways. It is used for supplying data entered in the "Daily Powder Report" (form 4, Fig. 104), also for entering in the record of the individual machine drills, and for distributing the amount of powder used in Development work, in Exploring and in breaking Surface Waste, the balance is charged to Stopping.

In the above all drifting, cross-cutting

| DAILY POWDER REPORT. | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---------------|-----------------|------|-------|----------------|---------------|----------------|------|-------|-------------------|---------------|----------------|------|-------|-------------|---------------|----------------|------|-------|-------------|---------------|----------------|------|-------|
| MONTH | | | | | POWDER | | | | | YEAR | | | | | | | | | | | | | | |
| BIG MACHINES | | | | | SMALL MACHINES | | | | | BLASTING BOULDERS | | | | | HAND WORK | | | | | FUSE USED | | | | |
| Sticks Used | Holes Drilled | Holes per Shift | Ave. | Total | Sticks Used | Holes Drilled | Holes per Hole | Ave. | Total | Sticks Used | Holes Drilled | Holes per Hole | Ave. | Total | Sticks Used | Holes Drilled | Holes per Hole | Ave. | Total | Sticks Used | Holes Drilled | Holes per Hole | Ave. | Total |
| Day | | | | | Day | | | | | Day | | | | | Day | | | | | Day | | | | |
| Night | | | | | Night | | | | | Night | | | | | Night | | | | | Night | | | | |
| Total | | | | | Total | | | | | Total | | | | | Total | | | | | Total | | | | |

FIG. 104.

and raising in ore, or for the purpose of developing a known ore body is charged to the development work, while any such work done in searching for unknown ore bodies is charged to Exploration.

Tool Sharpening Report (Form 5, Fig. 105).—This report was started owing to the large number of drills and tools that were disappearing. This report is made out by the Blacksmith foreman, the blacksmith counts the sharp steel that is sent to each opening each day and reports the tools and drills that are returned from each opening.

These figures are entered in a K. and E. cross-section book No. 376 having columns with similar headings to the blacksmith's report printed by hand in them except that in place of the mine working column there is a date column. These pages are ruled to a tenth scale and are about $6\frac{1}{2}'' \times 8\frac{1}{2}''$ in size. The cross-sectioning aids greatly in keeping the figures in the columns vertical. In one part of the book a summary of all the workings is kept, while in another part there is an individual record of each working place where tools are received or sent out, the same headings being used as in the summary. These reports are balanced every change day and at the end of each month and the on-hand of all dull and sharp steel in the shop at the first of the month is taken. In this way an approximation is reached regarding the number of tools and drills lost, and also an idea of where the loss is occurring. From this report the superintendent readily learns whether the different machines are being supplied with sufficient sharp steel as well as other information.

[illegible]

FIG. 105.—FORM 5.

The men on the Electric locomotive report the number of cars delivered to the tramway bins in the book, the tramway men keep count

of the number of tram buckets sent out in another and sample each bucket as it is loaded, while the number of railroad cars and weight of ore shipped to the smelter are also reported in another book. From the different books the figures for these items are obtained for the different reports.

The foreman of the sawmill makes a report in regard to the time spent in framing timbers for the different openings. The machine shop foreman records in a journal the number of each machine received for repairs and the time that he received it. He keeps account of the cost of repairing the drill and finally reports when it was sent back to the mine. The machine drills, to facilitate this recording are marked with a brass tag screwed to them having a running number. By the number, the make and size of the drill is known as certain ranges of numbers are kept for each size and make of machine used in the mine.

Machine Drill Reports (Form 6, Fig. 106).— From this report of the machine shop foreman the monthly machine drill record is made out, using the powder reports to determine in what places the drill was working and who was running the drill. From the powder report the number of holes drilled is also obtained while the machine shop record shows when the drill was sent out and when taken in. Of course the cost is distributed according to the class of work that the drill was working on and the proper part of the cost of the repairs is apportioned to each account from the percentage of the time that the drill was used on that kind of work. This Monthly Machine Report is kept on a form as shown. By indexing the numbers of the men working on the different machines a record is kept of the work done by each drill runner.

Sampling Records.—At the Highland Boy mine the ore varies in value greatly within short distances, and from its appearance nothing can be told about what the ore will assay.

[illegible]

FIG. 106.—FORM 6.

On that account the ore has to be sampled closely, in fact every set of ore mined is sampled. To do this a sampler is employed on each shift. These samples are given a running number and a tag is nailed to the cap nearest the sample. This tag is punched out of linen mapping cloth and is marked with water-proof ink. This has been found to be the best way to mark the position of the samples, although several other methods were used. Besides the running number placed on the sample bag a paper tag containing the position of the set sampled with respect to the zero set, which is carried up from floor to floor, through the stope, is also put in.

The samplers record on a Floor Map the position of the different samples. On the Assay Map the final record is made.

The assay results are also written in the shift bosses' and the foreman's pocket note books, together with the running number of the sample. They use the tag to find the position of the sample. The assay results are also recorded on large Floor Maps, and the date of the sampling is also written in each set. These Floor Maps are kept on loose leaf pages 36 in. x 23 in. The title consists of "Utah Consolidated Mine Assay Map" with headings to designate the Level, Floor, Room, and the ore-body. On the inside end is a 4-in. margin carrying the perforations for binding, while at the outer edge is a 2 in. margin. This leaves a space $29\frac{3}{4} \times 19\frac{3}{4}$ available for the Floor Map. This is divided into squares $2\frac{1}{2}$ in. on the side and each of these squares is subdivided into 25 squares so that each set is represented by an area $1\frac{1}{2}$ in. square. The assays from the drifts, cross-cuts, and raises, which are sampled after each round is blasted are recorded on Assay cards, Fig. 107, form 7.

| LEVEL No. | | FLOORS OVER | | | LOCATION | | | | |
|-----------|---------------------|-------------|-------|-------------|----------|---------|-------------|-------|---------|
| Date | Previously Reported | Advanced | Total | Advanced in | Copper % | Gold \$ | Silver Ozs. | Block | Section |
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FIG. 107.—FORM 7.

Only the average of the assays for the week are recorded on these cards, but the individual assays can be obtained from the assayer's book. On the Assay plan map only the percentage of copper is recorded as

the gold and silver contents bears a fairly constant relation to the copper in the ore. After passing through a lean place in the stope, often rich ore is again struck. In fact many new ore bodies have been found by drifting into old stopes and exploring areas marked mineralized upon the old Geological Maps and the Assay Plans. This map shows the value of the geological mapping and of the keeping of Assay Plan Maps of each floor. In case that caving were attempted all the advantages of this work would be lost, which at this mine, owing to the fact that all the limestone carries some silica, the silica contents of the ore would be so increased that much, if not all, the gain in cheapened stoping costs would be eaten up by the higher smelting charge.

As has been intimated, Geological Maps are also kept showing the geological conditions in the stopes, drifts, and raises, the dip and strike of the faults, the position of the different contacts between quartzite and limestone and of the different monzonite dikes are indicated, especially such areas as show signs of mineralization.

The Drilling Report (Form 8, Fig. 108).—Often it is desirable to know what is the assay of the ore being mined so as to regulate the grade of ore shipped in order to take the best advantage of the smelting contract. To do this the form of report called Drilling Report is used.

| UTAH CONSOLIDATED MINING COMPANY DRILLING REPORT | | | | | | | | | | | | | | |
|--|---------------|----------------|-----------|-------|----------|----------------|-----------|-------|----------|----------------|-----------|-------|----------|---------|
| Date..... | | | | | | | | | | | | | | |
| Level | Working Place | Big Machines | | | | Small Machines | | | | Single Jackers | | | | Remarks |
| | | Place Drilling | Est. Tons | % Cu. | Tons Cu. | Place Drilling | Est. tons | % Cu. | Tons Cu. | Place Working | Est. Tons | % Cu. | Tons Cu. | |
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FIG 108.—FORM 8.

The place where the drill is working is determined from the sampler's report, while the assay of the ore in which the drill is working is determined from the assayer's book, or else from the Assay Plan Map. The amount of ore broken is determined by estimation. For large machines in stopes 40 tons per day are used, for small machines 30 tons per day, and for hand drilling the amount of ore trammed from each opening. By these approximations the grade of ore being mined is determined and adjusted.

[illegible]

Experience has shown that this method is accurate and gives a mixture assaying within a few tenths of a per cent. of the grade calculated. These are all the primary reports, from them other reports are made up.

Daily Labor Report.—The Daily Labor Report is made out by the timekeeper. This report is used in plotting the Labor Chart already mentioned.

The first column is for the date, then comes labor grouped under the general headings, Day shift, Afternoon shift, Night shift and Total labor. The sub-headings under the first three are: Shift boss, Mine foreman, Timberman, \$2.75 miners, Muckers, \$3.00 miners, Machiners, machine helpers, timbermen helpers, Total number of men, Tons of ore mined, Tons of ore mined per man per shift.

The Monthly report to which these daily reports are posted is Fig. 109.

Daily Machine Report (Form 10, Fig. 110).
—From the different mine reports a number of daily reports are made out. The Daily Machine Report is kept on blueprint paper printed from cross-section tracing cloth so as to give guide lines for the different figures as this facilitates the averaging which is done once a week and at the end of each month. The writing on the blueprint is done with caustic soda which gives a white line. This form is shown below.

Daily General Mine Report and Daily Labor and Machine Report.—The other daily reports are kept in K. and E. No. 376 cross-section books. Each of the two general mine reports takes two of the opposite pages, while in the back of the book is a summary of the different items for each month of the year. The headings of these two tables are given in the accompanying forms. These daily reports are totaled and averaged each week and at the end of each month.

[illegible]

FIG. 110.—FORM 10.

In the General Mine Report (form 11, Fig. 111), the number of cars shipped is obtained from the car book. The tons shipped are calculated from them by using the average weight of a car load of ore as determined during several months. The total number of men underground and also the total employed are obtained from the Labor Sheet. In calculating the tonnage per man the estimated tramway tonnages are used as these are the most accurate figures obtainable at the mine since the average weight of a bucket of ore as determined during several months is used. The underground labor is estimated from the Labor Sheet. The ore sent over the tramway is estimated in the manner already indicated, while the analysis of the ore is that of the grab sample taken from the different buckets at the tramway loading station. The last column is calculated from the total tons shipped since the first of the month; this column is important as indicating whether or not sufficient ore is being mined.

In the second report called Daily Labor and Machine Report the miscellaneous labor items are obtained from the labor sheet, the data on the machine drills is obtained from the sampler's reports, the weekly advance from the weekly reports of exploration and development, the mine assays from the preceding daily report, and the smelting assays from the smelting reports.

Monthly Summaries.—In the back of the daily report book, the summary for each year takes up two pages. The months are the headings for the vertical columns, while the side headings are as follows: Number of R. R. cars shipped, Number of Buckets sent over the Tramway, Estimated tonnage from R. R. cars, The same from Tramway Buckets, Actual number of tons shipped, per cent. copper in ore from

[illegible]

FIG. 111.—FORM 11.

bins, Same from mine samples, Same from smelter pulp, per cent. iron from ore in ore bins, Same from smelter pulp, per cent. silica from ore in bins, Same from smelter pulp, Ounces Gold in ore from bins, Same from mine samples, Same from smelter pulp, Ounces Silver in ore from ore bins, Same from mine samples, Same from smelter pulp, per cent. lime in smelter pulp, per cent. Magnesium in smelter pulp, per cent. lead in smelter pulp, per cent. moisture in smelter pulp, Total misc. labor, Average of same per day, Total Underground Labor, Average of same per day, Total men employed, Average of same per day, Tons per man underground (buckets), Tons per man underground, actual, Tons per man employed (buckets), Tons per man employed, actual, Average number of machines on waste per day, Average number of machines on ore per day, Average total number of machines running per day, Advance in Drifts, Raises, etc., Average tons per day from buckets, Same from R. R. cars, Same from actual weight.

The Daily Powder Reports are kept in a K. and E. No. 376 book, the forms for the 30 per cent. and 40 per cent. dynamite occupy two pages each. The form for each grade is the same. All the data for these powder reports is obtained by compiling the powder reports from the different magazines.

[illegible]

FIG. 112.—FORM 12.

SMELTING COPPER ORE

ACCOUNTING METHODS OF THE CALUMET AND ARIZONA MINING COMPANY

The Smelting works of the Calumet and Arizona Mining Company are located at Douglass, Arizona. The plant is equipped with six furnaces, having a capacity of 2500 tons per day and the necessary Converters to handle the furnace output. Ore from the mines averages about 84 lb. of Copper per wet ton, equal to 4.2 per cent. and also contains precious metal values.

The ore comes to the smelter in cars and is dumped in bins, the oxides and sulphides being kept separate.

The smelting is accomplished in blast furnaces, the fuel being mixed with the charge. It consists essentially of subjecting the ores mixed with suitable fluxes to make a charge, to the action of intense heat, whereby the charge is rendered fluid; the gangue combining with the flux to form a slag, while the metals combine to form a matte.

The separation of the slag and matte takes place while in a molten condition, by reason of the difference in specific gravity.

In copper smelting the valuable product from the furnace is copper "matte" when sulphide ores are treated, and "black copper" when oxide or carbonate ores are treated.

For smelting, the mixture of ores and fluxes must be of such a composition that the resulting slag will be sufficiently liquid to allow the matte to separate from the mass readily and flow freely from the furnace.

This matte is transferred from the furnaces to Converters with the aid of electric cranes, and "blown" to "Blister Copper" in the Converters. As the resulting slag from this operation contains metallic contents, it is placed back in the furnace for further treatment.

The final product of the smelter is blister copper which contains precious metal values; it is necessary to receive further treatment at a refinery to remove the precious metals before the copper is ready for commercial use.

SMELTING COPPER ORE

OPERATING ACCOUNTS—SMELTER BOOKS

| Expense accounts | Closed accounts | Shop accounts |
|-------------------|-------------------------|-----------------|
| General Expense | Laboratory Expense | Machine Shop |
| Office Expense | Boiler House Expense | Blacksmith Shop |
| Furnace Expense | Power House Expense | Carpenter Shop |
| Converter Expense | Delivering Ore and Coke | Electrical Shop |
| Supplies | Loading Bullion | |
| Coke | Briquetting Press | |
| Cash | Pumping | |
| | Mud Mill | |
| | Crane Expense | |
| | Hauling Slag | |
| | Repair of Buildings | |
| | Repair of Dwellings | |
| | Lighting Expense | |
| | Warehouse Expense | |
| | Electric Plant | |
| | Engineering | |
| | Ore Sampling | |
| | Unloading Ore | |

EXPENSE ACCOUNTS

General Expense.—Charge to this account:

| | |
|-------------------------------|---------------------|
| Watchman as per time book | Ice |
| Stableman as per time book | Laboratory Expense |
| Change room boy time book | Pumping Expense |
| Labor and supplies to operate | Repair of Buildings |
| the Change room and Stables | Repair of Dwellings |
| Heating | Lighting Expense |
| Insurance | Warehouse Expense |
| Line Rider as per time book | Engineering Expense |
| Telegrams | Sampling Ore |
| Telephones | Personal Injuries. |
| Taxes | |

This account will receive credit for Dwelling and Land Rents, also unclaimed wages.

Office Expense.—Charge this account with:

| | |
|------------------------------------|--|
| Superintendent as per time book | Yard Clerk as per time book |
| Clerk as per time book | Janitor as per time book |
| Asst. Clerk as per time book | Postage and Box rent |
| Stenographer as per time book | Printing and Stationery |
| Night Time Keeper as per time book | Office Furniture and Fixtures |
| | Labor and supplies to operate and maintain the Office. |

This account will receive credit for all commissions on collections.

port is taken from the Daily Smelter Reports. The report is kept in book form.

Gas Analysis Report.—This report (form 30, Fig. 116) is intended to cover the analysis of smelter gases. The results of these analysis are recorded showing date, place and description with a result of the analysis, showing the per cent. of the ingredients of the gas sample by volume.

CLOSED ACCOUNTS

Laboratory Expense.—Charge this account with:

Chemist as per time book
Asst. Chemist as per time book
Labor as per time book
All labor and supplies to operate and maintain the Laboratory.

This account is closed out to General Expense each month.

Boiler House Expense.—Charge this account with:

Foreman as per time book
Fireman as per time book
Masons as per time book
Laborers as per time book
Fuel Oil
All Labor and supplies to operate and maintain the Boiler plant.

This account is closed out each month to the various accounts benefited on a basis of horse power used.

Boiler-room Record.—A daily report covering the operation of the steam generating plant is made out to cover the 24 hour period (form 64, Fig. 117).

This report shows the feed water pumped to the boilers, the oil and packing used, temperature of water and gases at various points, fuel oil received and used, and information pertaining to the economical working of the plant. This report is made out by the foremen in charge on the different shifts.

Water-treatment Record.—Owing to the fact that all water for steam purposes is too hard and severe on the boilers for economic use, it is first treated to soften and purify it. The details of this treatment are recorded on a Water-treatment Report (Form 31, Fig. 118) showing date, place and quantity treated, hardness, both initial and final, chemicals used, itemized and sub-divided to show quantity and cost, total cost, etc.

This report is made out by the chemist in charge.

| BOILER ROOM RECORD. | | | | | | | | | |
|---|-----------------|-----------|------------------|-----------|------------------|----------|-------|--------------------|---------|
| Calumet & Arizona Smelter, Douglas, Ariz. | | | | | | | | | |
| Month, | | Day | | | | | | | |
| Feed Pumps | 7 A.M. - 3 P.M. | | 3 P.M. - 11 P.M. | | 11 P.M. - 7 A.M. | | Total | | |
| | Rev. | Gallons | Rev. | Gallons | Rev. | Gallons | | | |
| Prescott # 1 | | | | | | | | | |
| # 2 | | | | | | | | | |
| Total per Shift | | | | | | | | | |
| OIL | | | | | PACKING | | | | |
| Kind | Quantity | | Kind | Quantity | | | | | |
| | Feed Pump | Oil Pump | | Feed Pump | Oil Pump | | | | |
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| TEMPERATURES | | | | | | | | | |
| Furnace Water | Well Water | Cold Well | Hot Well | Heater | Economizer | | | | |
| | | | | | | | | | |
| FUEL OIL STATEMENT | | | | | | | | | |
| RECEIVED | | | | | | | | Used | On Hand |
| Car | No. | Cap. | G. | St. M. | Gls. | Sediment | Water | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Steam Pressure | | | | | | | | Repairs on boilers | |
| Boilers Working | | | | | | | | | |
| Boilers Idle | | | | | | | | Repairs on pumps | |
| Boilers Cleaned | | | | | | | | | |
| Water per lb. of fuel | | | | | | | | | |
| Equiv. per lb. of fuel | | | | | | | | | |
| Equiv. per lb. of combustible | | | | | | | | | |
| Tons ore smelted per lb. of fuel | | | | | | | | | |
| Fuel per ton ore smelted | | | | | | | | | |
| Water per ton ore smelted | | | | | | | | | |
| Remarks | | | | | | | | | |
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FIG. 117.—FORM 64.

[illegible]

FIG. 118.—FORM 31.

Fuel Oil Tests.—Crude oil is used as fuel and as it is purchased on a basis of degrees Beaume and B. T. U.'s each car received is tested. All data covering oil received and tests is recorded on Fuel Oil Test Reports, (Form 32, Fig. 119.) These reports show the Date received, place, gallons, etc. Reports are made out by the chemist in charge.

[illegible]

FIG. 119.—FORM 32.

Power-house Expense.—Charge this account with:

Engineers as per time book
Oilers as per time book
Pumpmen as per time book
Boiler House Expense, proportion
All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of horse-power used.

Delivering Ore and Coke Expense.—Charge this account with:

Foreman as per time book
Elevator man as per time book
Charge Wheelers as per time book
Boiler House, proportion
All labor and supplies used to operate and maintain the service.

This account is closed out each month to Furnace Expense.

Loading Bullion Expense.—Charge this account with:

Labor and supplies
Boiler House proportion
All expense to operate and maintain the service.

This account is closed out to Converter expense each month.

Briquetting Press Expense.—Charge this account with:

Foreman as per time book
Feeders as per time book
Electric Plant, proportion
All labor and supplies to operate and maintain the service.

This account is closed out each month to Furnace Expense.

Pumping Expense.—Charge this account with:

Pumpmen as per time book
Boiler House, proportion
All labor and supplies to operate and maintain the service.

This account is closed out each month to General Expense.

Mud Mill Expense.—Charge this account with:

Foreman as per time book
Runners as per time book
Liners and helpers as per time book
Electric Plant, proportion
All labor and supplies to operate and maintain the service.

This account is closed out each month to Converter Expense.

Crane Expense.—Charge this account with:

- Crane men as per time book
- Chasers as per time book
- Electric Plant, proportion
- All labor and supplies to operate and maintain the service.

This account is closed out to Converter Expense each month.

Hauling Slag Expense.—Charge this account with:

- Runners and Helpers as per time book
- Electric Plant, proportion
- All labor and supplies to operate and maintain the service.

This account is closed out each month to Furnace Expense.

Repairs of Buildings.—Charge this account with:

- Carpenters as per time book
- Painters as per time book
- Masons as per time book
- All labor and supplies to maintain plant buildings.

This account is closed into General Expense each month.

Repairs to Dwellings.—Charge this account with:

- Carpenters as per time book
- Painters as per time book
- Masons as per time book
- All labor and supplies to maintain company Dwellings.

This account is closed into General Expense each month.

Lighting Expense.—Charge this account with:

- Electric plant, proportion
- All labor and supplies to operate and maintain the service.

This account is closed into General Expense each month.

Warehouse Expense.—Charge this account with:

- Supply Clerk and assistant as per time book
- All labor and supplies to operate and maintain the department.

This account is closed into General Expense each month.

Electric Plant Expense.—Charge this account with:

- Engineers as per time book
- Boiler House, proportion
- All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of current used.

Electric Power Record.—A Daily Report (form 65, Fig. 120) covering the output of the Electric Plant is made out by the engineers in charge each shift, showing the current furnished each circuit each shift.

| Form 65 | | | | |
|------------------------------------|----------|------|------------|---------|
| ELECTRIC POWER RECORD | | | | |
| Calumet & Arizona Smelter Douglass | | | | |
| Month..... | Day..... | | 19..... | |
| ALTERNATING CURRENT | | | | |
| | Present | Last | Difference | Remarks |
| Relining Plant | | | | |
| Briquetting Plant | | | | |
| Incandescent Lights | | | | |
| DIRECT CURRENT | | | | |
| | Present | Last | Difference | Remarks |
| Crane circuit | | | | |
| B. S. Shop | | | | |
| Mach. Shop | | | | |
| Cranes | | | | |
| Slag Circuit | | | | |
| Sampling Mill | | | | |
| Electric Shop | | | | |
| Slag Line | | | | |
| Arc Lamps | | | | |

FIG. 120.—FORM 65.

Engineering Expense.—Charge this account with:

- Engineers as per time book
- All labor and supplies to operate and maintain the service.

This account is closed into General Expense each month.

Ore Sampling Expense.—Charge this account with:

- Foreman as per time book
- Samplers as per time book
- Switching to and from sampler
- All labor and supplies to operate and maintain the service.

This account is closed into General Expense each month.

Unloading Ore.—Charge this account with:

- All labor and supplies to operate and maintain the service.

This account is closed into Furnace Expense each month.

SHOP ACCOUNTS

Machine Shop Expense.—Charge this account with:

Superintendent of Machinery as per time book
Master Mechanic as per time book
Machinists and helpers as per time book
Electric Plant, proportion
All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of labor performed.

Blacksmith Shop Expense.—Charge this account with:

Foreman as per time book
Blacksmiths as per time book
All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of labor performed.

Carpenter Shop Expense.—Charge this account with:

Foreman as per time book
Carpenters as per time book
All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of labor performed.

Electrical Shop Expense.—Charge this account with:

Foreman as per time book
Electricians as per time book
All labor and supplies to operate and maintain the plant.

This account is closed out each month to the various accounts benefited on a basis of labor performed.

ACCOUNTING, GENERAL STATEMENT

The detailed accounts carried on the Smelter books are subsidiary to the Smelter accounts carried on the Mine books as follows:

| | |
|----------|---------------|
| Cash | Operation |
| Supplies | Construction. |
| Coke | |

All supplies and material for the smelter are purchased through the Purchasing agent at the mine and all invoices of whatever nature against the smelter pass through the mine books, being charged through the Voucher Record to the Smelter Accounts effected. (The Voucher Record used is similar to that used by the Ojibway Co.)

Invoices.—All invoices are received by the company in triplicate and forwarded to the smelter clerk. They are checked as to material received etc., and entered in the stock records (form 40, Fig. 121).

[illegible]

FIG. 121.—FORM 40.

A separate card is kept for each kind or size of supplies purchased.

All invoices are O. K'd by the supply clerk for receipt of material and approved by the smelter superintendent for payment. The original and duplicate copies are forwarded to the mine for payment, being paid by the mine clerk and charged to the smelter accounts previously mentioned. The triplicate copy is retained at the smelter office.

All invoices are recorded in detail in a book "Record of Invoices Received" (Fig. 122).

[illegible]

FIG. 122.

Supplies.—As stated above supplies received are entered on stock record cards, which show the invoice cost to which is also added the freight.

Supplies are only given out at the warehouse on presentation of an order signed by the head of the department requiring the same, form 41, Fig. 123.

Douglass, Ariz.

Supply Clerk, Please give bearer the following

| No. | Articles | Charge |
|-----|----------|--------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

NOTE: Supply Clerk will not issue material without this ticket.

FIG. 123.—FORM 41.

These orders must state the quantity and kind of material required and the account to which the charge should be made. From these orders the material used is charged off on the stock record cards and the values entered on the orders. The supplies used can now be posted to the Supplies Used Sheets (not shown, similar to the Ojibway Mining Co.) from the Supply Orders. The supplies are entered against the proper account or sub-division as the case may call for. At the end of the month the sheets are totaled and summarized.

Freight Expense Bills.—All freight expense bills are entered in a book for that purpose as follows (Figs. 124-5):

[illegible]

FIG. 124.

Engaging Labor.—Applications for situations with the company are made out on blanks provided for the purpose (form 42, Fig. 126) and besides the other information called for, must name two previous employers as reference.

[illegible]

FIG. 125.

Upon the filing of an application properly signed with the company, the matter is then taken up with the parties given as reference:

In taking the matter up with the parties given as reference a regular form (No. 43, Fig. 127) is used for the purpose, the replies to the information called for on this form are made on the lower part of the sheet

Calumet & Arizona Mining Co.
Superior and Pittsburg Copper Co.

APPLICATION FOR SITUATION

For position as

1. Name in full

2. Age

3. Nationality

4. Married or single

5. If married is family here

6. Where was your last employment and when

7. By whom employed

8. To whom do you refer as to your personal character and qualifications for position as

A

B

In order that the may be fully informed as to my personal character and my qualifications for the positions for which I have made application I refer to each of my former employers and request and authorize each of the companies for whom I have worked to give the above named company all the information they may be in possession of whether shown by my personal record or otherwise, as to my personal character and also my qualifications for the position I have herein applied for, and the reason why I was discharged or quit their service, upon any inquiry that may be made of them or either of them by said mining company.

Dated..... Signed.....

Employed by.....

FIG. 126.—FORM 42.

so that both questions and answers are on one sheet and come back to the company and are filed away as reference.

All employees of the company are given numbers when they are assigned work, these numbers run from one up and do not have a continuous expansion, that is an employee having as his number ten and leaving the employ of the company would leave that number vacant so that the next man to enter the employ of the company would be assigned the number ten. The lowest vacant numbers are always given out first so that the range of numbers in use will be as low as possible, this facilitates matters greatly when making up the Pay-roll.

Calumet & Arizona Mining Co.

Bisbee, Ariz.....

Dear Sir:

Mr..... has applied to this company for work as a He states he was in your employ in and refers us to you as to his personal character and competency. A reply below will greatly oblige and will be regarded as confidential. An early answer is particularly requested, as we are waiting for such reply before putting him to work.

By.....

Third Vice-President

Mr. Worked for us as stated
Has not been in our employ

His work was satisfactory
unsatisfactory

His character was

Signed.....

FIG. 127.—FORM 43.

Time Books.—All time is kept by timekeepers both day and night; this is taken down in pocket time books, ruled for a month of 31 days; the time is transferred from these books to an office time book each day. The office time book is ruled the same as the pocket time book except that it is of a great deal larger size. In both time books the various classes of labor are segregated so that Surface laborers would be grouped together, Carpenters together, etc. At the end of the month the time is extended and the gross amount due each employee is figured and entered in the office time book. The amount due each class of labor is totaled

[illegible]

Fig. 128.

| DETAILS OF EXPENSES | | | | | |
|-----------------------------------|------|------|--------|--------|-------|
| GENERAL EXPENSE | Days | Rate | Amount | Amount | Total |
| Watchman | | | | | |
| Stableman | | | | | |
| Change room Boy | | | | | |
| Laborers | | | | | |
| Gen'l Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Heating | | | | | |
| Fire Insurance | | | | | |
| Line Rider | | | | | |
| Telegrams | | | | | |
| Telephoning | | | | | |
| Taxes | | | | | |
| Ice | | | | | |
| Laboratory Expense | | | | | |
| Pumping Expense | | | | | |
| Repair of Buildings | | | | | |
| Dwellings | | | | | |
| Lighting Expense | | | | | |
| Warehouse Expense | | | | | |
| Engineering Expense | | | | | |
| Sampling Ore | | | | | |
| Personal Injuries | | | | | |
| Total | | | | | |
| CREDITS, Land Rents | | | | | |
| Rent for Dwellings | | | | | |
| Unclaimed Checks Cancelled | | | | | |
| NET | | | | | |
| OFFICE EXPENSE | | | | | |
| Superintendent | | | | | |
| Clerk | | | | | |
| Asst. Clerk | | | | | |
| Stenographer | | | | | |
| Night Time Clerk | | | | | |
| Yard Clerk | | | | | |
| Janitor | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Postage and Box Rent | | | | | |
| Printing and Stationery | | | | | |
| Office Furniture and Fixtures | | | | | |
| Total | | | | | |
| CREDIT, Commission on Collections | | | | | |
| NET | | | | | |
| FORWARD | | | | | |

FIG. 136.

| DETAILS OF EXPENSE | | | | | |
|---------------------------------|------|------|--------|--------|-------|
| FURNACE EXPENSE | Days | Rate | Amount | Amount | Total |
| General Foreman | | | | | |
| Foreman | | | | | |
| Feeders | | | | | |
| Tappers | | | | | |
| Tappers Helpers | | | | | |
| Slag Men | | | | | |
| Laborers | | | | | |
| Masons | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Demurrage on Coke | | | | | |
| Coke | | | | | |
| Power House for Blast | | | | | |
| Delivering Ore and Coke Expense | | | | | |
| Briquetting Press Expense | | | | | |
| Hauling Slag Expense | | | | | |
| Unloading Ore Expense | | | | | |
| Total | | | | | |
| CREDIT | | | | | |
| Sales Old Brass castings | | | | | |
| NET | | | | | |
| CONVERTER EXPENSE | | | | | |
| General Foreman | | | | | |
| Foreman | | | | | |
| Skimmers | | | | | |
| Punchers | | | | | |
| Moulders | | | | | |
| Masons | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Coke | | | | | |
| Power House for Blast | | | | | |
| Mud Mill Expense | | | | | |
| Crane Expense | | | | | |
| Loading Bullion Expense | | | | | |
| Loss on Silicious Ore (lining) | | | | | |
| Total | | | | | |
| Credits, Sales of Scrap Iron | | | | | |
| Profit on Silica Sold | | | | | |
| Profit on Ore Used as Lining | | | | | |
| NET | | | | | |
| TOTAL SMELTER EXPENSE | | | | | |

FIG. 137.

| DETAILS OF EXPENSE | | | | | |
|--|------|------|--------|--------|-------|
| LABORATORY EXPENSE | Days | Rate | Amount | Amount | Total |
| Chemist | | | | | |
| Asst. Chemist | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Determinations @ | | | | | |
| Charged to General Expense | | | | | |
| BOILER HOUSE EXPENSE | | | | | |
| Foreman | | | | | |
| Fireman | | | | | |
| Asst. Fireman | | | | | |
| Laborers | | | | | |
| Masons | | | | | |
| Gen. Supplies Lumber | | | | | |
| I and S Oils | | | | | |
| P and F Tools | | | | | |
| Machy. Fuel | | | | | |
| Dumurrage | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Total | | | | | |
| Per Cent. Charged to Loading Bullion | | | | | |
| Per Cent. Charged to Power House Expense | | | | | |
| Per Cent. Chgd. to Delivering Oil and Coke | | | | | |
| POWER HOUSE EXPENSE | | | | | |
| Engineers | | | | | |
| Oilers | | | | | |
| Pumpmen | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Boiler House for Steam | | | | | |
| Total | | | | | |
| Per Cent. Charged to Furnace Expense | | | | | |
| Per Cent. Charged to Converter Expense | | | | | |
| Per Cent. Charged to Electric Plant | | | | | |
| Per Cent. Charged to Pumping Plant | | | | | |
| Per Cent. Charged Delivering Oil and Coke. | | | | | |
| Gallons Engine Oil Used per Day | | | | | |
| Gallons Cylinder Oil Used per Day | | | | | |

FIG. 138.

| DETAILS OF EXPENSE | | | | | |
|---------------------------------------|------|------|--------|--------|-------|
| DELIVERING ORE & COKE EXPENSE | Days | Rate | Amount | Amount | Total |
| Foreman | | | | | |
| Elevator Men | | | | | |
| Charge Wheelers | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Boiler House for Steam | | | | | |
| Tons Wet Ore to Furnace | | | | | |
| " Coke " | | | | | |
| " Briquettes " | | | | | |
| " Slag " | | | | | |
| " Lime Rock " | | | | | |
| " Delivered at per Ton | | | | | |
| LOADING BULLION EXPENSE | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Boiler House for Steam | | | | | |
| Loading, Tons Bullion @ per Ton | | | | | |
| Charged to Converter Expense | | | | | |
| BRIQUETTING PRESS EXPENSE | | | | | |
| Foreman | | | | | |
| Feeders | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Elect. Plant for Power | | | | | |
| For Briquetting Tons of | | | | | |
| Briquettes @ per Ton | | | | | |
| Average Copper | | | | | |
| Charged to Furnace Expense | | | | | |

FIG. 139.

| DETAILS OF EXPENSE | | | | | |
|-----------------------------|----------------------------------|------|--------|--------|-------|
| PUMPING EXPENSE | Days | Rate | Amount | Amount | Total |
| Pumpmen | | | | | |
| Laborers | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Lumber | | | | |
| P and F | Oils | | | | |
| Machy. | Tools | | | | |
| Machy. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Power House for Steam | | | | | |
| | | | | | |
| | | | | | |
| MUD MILL EXPENSE | | | | | |
| Foreman | | | | | |
| Runners | | | | | |
| Liners | | | | | |
| Liners Helpers | | | | | |
| Laborers | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Oils | | | | |
| P and F | Lumber | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Demurrage | | | | | |
| Elect. Plant for Power | | | | | |
| For lining | Converters @ each | | | | |
| | Tons Fine Copper made per Lining | | | | |
| CRANE EXPENSE | | | | | |
| Crane Man | | | | | |
| Chasers | | | | | |
| Laborers | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Lumber | | | | |
| P and F | Oils | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Elect. Plant for Power | | | | | |
| Charge to Converter Expense | | | | | |

FIG. 140.

| DETAILS OF EXPENSE | | | | | |
|---------------------------|-----------------|------|--------|--------|-------|
| HAULING SLAG EXPENSE | Days | Rate | Amount | Amount | Total |
| Runners | | | | | |
| Runners Helpers | | | | | |
| Laborers | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Lumber | | | | |
| P and F | Oils | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Elect. Plant for Power | | | | | |
| For Hauling | Pots Slag@ each | | | | |
| Charge to Furnace Expense | | | | | |
| REPAIRS OF BUILDINGS | | | | | |
| Painters | | | | | |
| Laborers | | | | | |
| Masons | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Oils | | | | |
| P and F | Lumber | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Charge to General Expense | | | | | |
| REPAIRS OF DWELLINGS | | | | | |
| Painters | | | | | |
| Laborers | | | | | |
| Masons | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Oils | | | | |
| P and F | Lumber | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Charge to General Expense | | | | | |
| LIGHTING EXPENSE | | | | | |
| Laborers | | | | | |
| Gen. Supplies | Elect. | | | | |
| I and S | Lumber | | | | |
| P and F | Oils | | | | |
| Machy. | Tools | | | | |
| Mach. Shop | Bks. | | | | |
| Carpt. | Elect. | | | | |
| Electric Plant for Power | | | | | |
| Charge to General Expense | | | | | |

FIG. 141.

| DETAILS OF EXPENSE | | | | | |
|----------------------------------|------|------|--------|--------|-------|
| WAREHOUSE EXPENSE | Days | Rate | Amount | Amount | Total |
| Supply Clerk | | | | | |
| Asst. Supply Clerk | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Printing | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Charged to General Expense | | | | | |
| ELECTRIC PLANT EXPENSE | | | | | |
| Laborers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Power House for Power | | | | | |
| Total | | | | | |
| Per Cent. Charged to Mud Mill | | | | | |
| Per Cent. " Crane Expense | | | | | |
| Per Cent. " Hauling Slag | | | | | |
| Per Cent. " Briquette Press Exp. | | | | | |
| Per Cent. " Lighting Expense | | | | | |
| Per Cent. " Mach. Shop Expense | | | | | |
| Per Cent. " Pumping | | | | | |
| ENGINEERING EXPENSE | | | | | |
| Engineers | | | | | |
| Laborers | | | | | |
| Supplies | | | | | |
| Mach. Shop Bks. | | | | | |
| Carpt. Elect. | | | | | |
| Charge to General Expense | | | | | |
| ORE SAMPLING EXPENSE | | | | | |
| Foreman | | | | | |
| Samplers | | | | | |
| Laborers | | | | | |
| Supplies | | | | | |
| Shops | | | | | |
| Switching to and from Sampler | | | | | |
| Charged to Sundries | | | | | |
| UNLOADING ORE EXPENSE | | | | | |
| Laborers | | | | | |
| Charge to Furnace Expense | | | | | |

FIG. 142.

| DETAILS OF EXPENSE | | | | | |
|-------------------------|------|------|--------|--------|-------|
| MACHINE SHOP EXPENSE | Days | Rate | Amount | Amount | Total |
| Supt. of Machinery | | | | | |
| Master Mechanic | | | | | |
| Machinists | | | | | |
| Machinists Helpers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Carpt. Shop Elect. | | | | | |
| Bks. | | | | | |
| Elect. Plant for Power | | | | | |
| Charged to Sundries | | | | | |
| BLACKSMITH SHOP EXPENSE | | | | | |
| Foreman | | | | | |
| Blacksmiths | | | | | |
| Helpers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Elect. | | | | | |
| Carpt. | | | | | |
| Charge to Sundries | | | | | |
| CARPENTER SHOP EXPENSE | | | | | |
| Foreman | | | | | |
| Carpenters | | | | | |
| Helpers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Elect. | | | | | |
| Bks. | | | | | |
| Charge to Sundries | | | | | |
| ELECTRICAL SHOP EXPENSE | | | | | |
| Foreman | | | | | |
| Electricians | | | | | |
| Helpers | | | | | |
| Gen. Supplies Elect. | | | | | |
| I and S Lumber | | | | | |
| P and F Oils | | | | | |
| Machy. Tools | | | | | |
| Mach. Shop Elect. | | | | | |
| Carpt. Bks. | | | | | |
| Charged to Sundries | | | | | |

FIG. 143.

| SUPPLY ACCOUNT | | | | | |
|--|--|------------------|------------|---------------------|----|
| Dr. | | | | Cr. | |
| | | Balance | 19 | Smelter Expense | |
| | | Purchases | | Construction | |
| | | Labor | | Shops | |
| | | Shops | | Sales and Refunds | |
| | | C and A Mng. Co. | | Pay-roll Deductions | |
| | | Fire Clay Quarry | | C and A Mng. Co. | |
| | | Silica Quarry | | C Q Mng. Co. | |
| | | | | Ore Purchases | |
| | | | | Balance | 19 |
| | | | | General | |
| | | | | I and S | |
| | | | | P and F | |
| | | | | Machy. | |
| | | | | Elect. | |
| | | | | Lumber | |
| | | | | Oils | |
| | | | | Tools | |
| | | | | Fuel | |
| | | | | Ore Purchases | |
| | | | | Total | |
| COKE ACCOUNT | | | | | |
| | | Balance | 19 | Smelter Expense | |
| | | Purchases | | Refunds | |
| | | Labor | | C and A Mng. Co. | |
| | | | | C Q Mng. Co. | |
| | | | | Balance | 19 |
| STATEMENT OF PAY-ROLL AND BILLS AUDITED ACCOUNTS | | | | | |
| | | Gross | Deductions | Net | |
| Pay-roll | | | | | |
| Bills Audited | | | | | |
| | | | | | |

FIG. 144.

[illegible]

FIG. 145.

| STATEMENT OF ORE PURCHASED | | | | | | | | |
|--|---------------|-----|---------|-----|---------|----------|------------|-------------|
| Shipper | Weight (Tons) | | Assay | | | Contents | | |
| | Wet | Dry | Au. | Ag. | Cu. | Gold Oz. | Silver Oz. | Copper Lbs. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Total | | | | | | | | |
| Values: Oz. Gold @ | | | | | | | | |
| Oz. Silver @ | | | | | | | | |
| Lbs. Copper @ | | | | | | | | |
| | | | | | | | | |
| Total | | | | | | | | |
| COST: Paid Shipper | | | | | | | | |
| | | | | | | | | |
| Freight, etc. | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Net profit on Dry tons | | | | | | | | |
| " " per " " | | | | | | | | |
| | | | | | | | | |
| SILICIOUS-ORE-TREATED (Converter Lining) | | | | | | | | |
| Wet H ₂ O Dry | | | | | | | | |
| Cost: | tons at | | per ton | | | | | |
| Values: | | | | | | | | |
| Average price fine copper | | | | | | | | |
| Less freight, etc. | | | | | | | | |
| | | | | | | | | |
| Dry tons, average copper | | | | | | | | |
| Oz. Silver at | | | | | per oz. | | | |
| Lbs. Copper at | | | | | per lb. | | | |
| | | | | | | | | |
| Net | on | | tons | | | | | |
| Net | per ton | | | | | | | |
| TOTAL MATERIAL SMELTED | | | | | | | | |
| Ore | | | Tons | | | | | |
| | | | | | | | | |
| Slag | | | | | | | | |
| Briquettes | | | | | | | | |
| Lime Rock | | | | | | | | |
| Total Tonnage | | | | | | | | |
| Average per day | | | | | | | | |

FIG 146.

CHAPTER IV

MINING COAL AND MAKING COKE

ACCOUNTING METHODS OF THE UTAH FUEL COMPANY

The Utah Fuel Company own the
Pleasant Valley Coal Company
Wasatch Store Company.

The Utah Fuel Company operates the
Sunnyside Mine
Somerset Mine.

The Pleasant Valley Coal Company operates the
 Winter Quarters Mine
 Castle Gate Mine
 Clear Creek Mine
 Utah Mine.

Coke is manufactured at the
Castle Gate Mine
Sunnyside Mine.

The Wasatch Store Company have stores located at the various mines which do a general mercantile business with the employees of the company.

These mines are opened by slopes, from the foot of which the main entries are driven. The coal lies on a general dip, with local variations, sometimes quite sharp but not extensive. The main entries though not driven to follow the strike are quite level, being straightened up by filling and cutting after the adjacent coal is out. Butt entries are driven from the main entry and rooms turned each way from the out butts.

The coal is broken down in the rooms and loaded in cars to be hauled to the main entry by mules. It is taken by electric locomotives there made up into trains and run to the tippie, where the coal is crushed and screened, the various grades being run into separate bins. From these bins it is loaded into railroad cars for shipment.

The coke is made from slack coal delivered from the mine and manufactured in ovens. From these ovens it is loaded directly into railroad cars for shipment to consumers.

COST OF COAL AND COKE TO THE CONSUMER

| Profit and loss | | Profit on Sales | | | |
|--|--|---|--|--|--|
| Administrative | | Freight | Coal and Coke at Mines | | |
| General Expense Salaries Law Stationery, etc. General Exp. | Insurance Taxes Royalties Depreciation Personal Injuries Prospecting Interest Rents | General Expense Salaries Law Rents Stationery, etc. General Exp. | Coal Expense Mining Hauling Loading Repairs to Cars Repairs to Tracks Electric Lights Entry Driving Rooms and Rolls Ventilation Drainage and Watering Timber and Props Dead Work Repairs to Buildings and Chutes Repairs to Machinery Superintendence and Clerks Engineering General Expense Incidentals | | |
| | | | | | |
| Operating | | Coke Expense | | | |
| Coal Expense Coke Expense | | Coal Used Superintendence and Clerks Engineering Charging Ovens Burning and Drawing Loading Coke Loading Cinders Firing Cold Ovens Repairs to Coke Ovens Repairs to Buildings Coke Experiments Incidentals | | | |

| Profit and loss | | Earnings | | | |
|--|--|---|--|--|--|
| Administrative | | Operating | | | |
| General Expense Salaries Law Stationery, etc. General Exp. | Insurance Taxes Royalties Depreciation Personal Injuries Prospecting Interest, etc. Rents | Coal Expense Coke Expense | | | |
| | | | | | |
| Operating | | Coke Expense | | | |
| Coal Expense Coke Expense | | Coal Used Superintendence and Clerks Engineering Charging Ovens Burning and Drawing Loading Coke Loading Cinders Firing Cold Ovens Repairs to Coke Ovens Repairs to Buildings Coke Experiments Incidentals | | | |

NOTE.—Accounts underlined are debited with the items below them, which may be sub-accounts or direct charges. Consumer refers to dealers buying from the mines.

Note.—Accounts underlined are debited with the items below them, which may be sub-accounts or direct charges. Consumer refers to dealers buying from the mines.

GENERAL OFFICE LEDGER ACCOUNTS

| General ledger accounts | Accounts, auxiliary records | Closed account |
|----------------------------------|-----------------------------|----------------|
| 1. Cost of Property | 1. Expense of Mining | Power House |
| 2. Lands | 2. Hauling | |
| 3. Mine Development | 3. Loading | |
| 4. Tramways, Chutes and Trestles | 4. Repairs to Cars | |
| 5. Buildings | 5. Repairs to Tracks | |
| 6. Power and Machinery | 6. Electric Light | |
| 7. Cars and Tracks | 7. Entry Driving | |
| 8. Coke Ovens | 8. Rooms and Rolls | |
| 9. Boarding House Fixtures | 9. Ventilation | |
| 10. Saloon Buildings | 10. Drainage and | |
| 11. Machinery for Prospecting | Watering Mine | |
| 12. Earnings | 11. Timber and Props | |
| 13. Mine Expense..... | 12. Dead Work | |
| 14. Coke Expense..... | 13. Repairs to Buildings | |
| 15. General Expense | 14. Repairs to | |
| 16. Boarding House Expenses | Machinery | |
| 17. Boarding House Receipts | 15. Superintendence | |
| 18. Rents | and Clerks | |
| 19. Insurance | 16. Engineering | |
| 20. Taxes | 17. General Expense | |
| 21. Personal Injury Claims | 18. Incidentals | |
| 22. Coal Prospecting | 40. Coal Used | |
| 23. Depreciation of General | 41. Superintendence | |
| Plant, etc. | and Clerks | |
| 24. Interest, Discount and Ex- | 42. Engineering | |
| change | 43. Charging Ovens | |
| 25. Vouchers | 44. Burning and Draw- | |
| 26. Pay Rolls | ing | |
| 27. Treasurer | 45. Loading Coke | |
| 28. Unclaimed Wages | 46. Loading Cinders | |
| 29. Depreciation Account | 47. Firing Cold Ovens | |
| 30. Material and Supplies | 48. Repairs to Coke | |
| 31. Engineering Property | Ovens | |
| 32. Pay-roll Deficiency | 49. Repairs to Buildings | |
| 33. Personal Injury Fund | 50. Coke Experiments | |
| 34. Animals Killed and Sold | 51. Incidentals | |
| 35. Special Renewal Fund | | |
| 36. Individuals and Companies | | |
| 37. Water Supply | | |
| 38. Smithing | | |
| 39. Saw Mill | | |
| 40. Depreciation of Animals | | |
| 41. Profit and Loss | | |

GENERAL LEDGER ACCOUNTS

1. Cost of Property.—This account represents the total amount of the capital accounts for all mines of the company:

| | |
|-------------------------------|---------------------|
| Lands | Power and Machinery |
| Mine Development | Cars and Tracks |
| Tramways, Chutes and Trestles | Coke Ovens. |
| Buildings | |

These accounts are closed into Cost of Property each month by Journal entry.

2. Lands.—Representing the total cost of mining property, including all legal expenses in connection with acquiring the same, and any expense incurred for surveys and examinations, also preliminary prospecting of the property either before or after purchase.

This account represents the total cost of all lands owned by the company. It is closed into Cost of Property by Journal entry.

3. Mine Development.—Representing the total cost of developing all mines of the company until such time as they are placed on a producing basis except that when buildings and equipment of a permanent nature are erected or installed during the development stage, the expense thereof will be charged to the proper capital accounts.

All earnings from the sale of product during the development stage of a mine will be credited to this account. This account is closed into Cost of Property.

4. Tramways, Chutes and Trestles.—Representing the total cost of all permanent Tramways, Chutes, Trestles, Scales, Tipples, Screens, etc., for all the mines of the company. This account is closed into Cost of Property.

5. Buildings.—Representing the total cost of all permanent buildings for all mines of the company. This account is closed into Cost of Property.

6. Power and Machinery.—Representing the total cost for all mines of the company, of Machinery, Shop Tools, Power Equipment, Horses, Mules, Harness, etc. This account is closed into Cost of Property.

7. Cars and Tracks.—Representing the total cost for all mines of the company, of mine cars, coke oven larries, tracks, etc., except that when a mine is on a producing basis the maintenance of the above mentioned equipment and extensions of the track, are charged to operating expense. This account is closed into Cost of Property.

8. Coke Ovens.—Representing the cost of all ovens of the company at the different mines and the equipment of the same. This account is closed into Cost of Property.

9. Boarding House Fixtures.—Representing the total cost for all

mines of the company, of the Boarding house furniture, stoves, ranges, cooking utensils, beds and bedding, etc. This account is not intended to cover repairs and replacements of equipment which are charged to operating account of Boarding House.

10. Saloon Buildings.—Representing the cost of all buildings and the necessary fixtures which have been purchased or erected by the company for use as saloons.

11. Machinery for Prospecting.—Representing the cost of portable machinery which is used in prospecting, such as Diamond Drills, Hoists, Pumps, etc., all the above are charged to the company in general, and not to any particular mine.

12. Earnings.—This account represents the income from the sale of all Coal and Coke, and is charged with the expense of delivering Coal and Coke sold to the mines locally, also with any overcharges in price for Coal and Coke shipped. The account covers all mines of the company.

13. Mine Expense.—This account represents the total operating expenses for all Coal mine operations of the company. It is made up of the following accounts as shown by the mine records.

| | |
|---------------------|------------------------------------|
| A. Mining | J. Drainage |
| B. Hauling | K. Timber and Props |
| C. Loading | L. Dead Work |
| D. Repairs to Cars | M. Repairs to Buildings and Chutes |
| E. Repairs to Track | N. Repairs to Machinery |
| F. Electric Light | O. Superintendence and Clerks |
| G. Entry Driving | P. Engineering |
| H. Rooms and Rolls | Q. General Expense |
| I. Ventilation | R. Incidentals. |

14. Coke Expense.—Representing the cost of operating the coke ovens of the company and is made up of the following accounts as shown on the mine records

| | |
|-------------------------------|--------------------------|
| A. Coal Used | G. Loading Cinders |
| B. Superintendence and Clerks | H. Firing Cold Ovens |
| C. Crushing and Elevating | I. Repairs to Coke Ovens |
| D. Charging Ovens | J. Repairs to Buildings |
| E. Burning and Drawing | K. Coke Experiments |
| F. Loading Coke | L. Incidentals. |

15. General Expense.—This account comprises the following subdivisions:

A. General Office, Salaries and Expenses, covering the salaries of officers and clerks, Directors fees and expenses, office expenses, etc.

B. Law Expense.—To cover the salaries and expenses of attorneys, engaged in company business and not chargeable to

some specific account. Legal expense incurred on account of Personal injuries will be charged to the Personal Injury Fund.

- C. **Rents.**—To cover the rental of the general offices of the company.
- D. **Stationery and Printing.**—To cover the cost of stationery, books and supplies used at the general offices of the company.
- E. **General Expense.**—To cover advertising and such other sundry items as are not covered by the preceding accounts.

16. **Boarding House Expenditures.**—This account covers the cost of operating all boarding houses of the company.

17. **Boarding House Receipts.**—To cover all receipts for board furnished by all company boarding houses.

18. **Rents.**—This account represents the gross rentals from all houses owned by the company, less maintenance charges against the same.

19. **Insurance.**—The total amount of insurance premiums payable in each year is charged to this account. This amount is pro-rated one-twelfth each month. When the Insurance premiums are paid they are charged to Insurance account. Whenever a loss occurs by fire, a charge is made against the insurance company for the amount of loss and Property Destroyed account is credited. When the claim is settled if the full amount is not allowed, the difference is charged to an expense account.

20. **Taxes.**—The estimated amount of taxes payable each year is charged to this account and credited to Accrued Taxes account, pro-rated one-twelfth each month. When taxes are paid they are charged to Accrued Taxes account. Any adjustment necessary is made in charging out the final installments.

21. **Personal Injury Claims.**—This account is charged each month with an amount that is estimated to cover all claims for personal injuries and death from accident that are likely to occur during the year. Personal Injury Fund is credited with this amount and when settlements are made with individuals the amounts are charged to the Personal Injury Fund.

22. **Prospecting.**—This account is to cover all expenses incidental to the prospecting of Coal land both before and after purchasing. When lands which have been prospected are purchased the amount so expended will be charged to the cost of Lands, and credited to this account.

23. **Depreciation of General Plant Account.**—This account represents the amounts charged off each month and year for depreciation of property and plant, and this account is charged out to income each year, and appears on the Financial Statement each month as a charge to Income. The amounts charged to this account each month are credited to Depre-

ciation account, which remains on the books and is generally deducted from the total of the capital accounts or Cost of Property in making up the balance sheet.

24. **Interest Discount and Exchange.**—This account represents all interest received and paid, exchange paid and discounts taken.

25. **Vouchers.**—The total amount of vouchers for the month, as shown by the Abstract of Vouchers, is credited to this account, and charged to the accounts for which expenditures are made, as shown by the distribution in the Abstract of Vouchers. When Vouchers are paid, the Treasurer's account is credited and Voucher account is charged.

26. **Pay-roll.**—This account is credited with the gross earnings as shown by the Pay-roll Distribution, and charged with sundry pay-roll deductions, and when the net amount of the roll is paid by the Treasurer, the Pay-roll account is charged and the Treasurer is credited.

27. **Treasurer.**—This account is handled by the Auditor just the same as one would handle the cash account in case there was no treasurer of the company, in other words, the Treasurer is responsible for the cash, and is credited with all receipts and charged with all disbursements.

28. **Unclaimed Wages.**—Employees wages which are not called for on pay day (paid out), are placed to the credit of this account, and when the wages are claimed and paid out this account is charged.

29. **Depreciation Account.**—This account is credited each month with the amount charged to Depreciation of General Plant account, and the amounts set up to the credit of this account are usually allowed to remain on the books, and in making up the balance sheet the total of this account is deducted from the Cost of Property, before showing the same.

31. **Engineering Property.**—Covers all Transits, Levels, Rods, Tapes, Drawing Instruments, etc., all equipment for the engineering department.

32. **Pay-roll Deficiency.**—This account is intended to cover pay-roll overdrafts which are charged to this account. When the overdrafts are collected on the following month's pay-roll, this account receives credit.

33. **Personal Injury Fund.**—An estimated yearly amount to cover claims for personal injuries and deaths from accidents while in the company's employ is pro-rated one-twelfth each month into Personal Injury Claims and credited to this fund. When claims are paid they are charged to this account.

34. **Animals Killed and Sold.**—When an animal is killed or sold its value is credited to this account and charged to Hauling. Animals purchased to replace those killed or sold will be charged to this account.

35. **Special Renewal Fund.**—This account is credited with income from the sale of old material, scrap metal, etc. Charges to this account are for renewals to plant, etc.

36. Individuals and Companies.—Coal Sales. This account represents the accounts receivable from the sale of Coal and Coke, the detail accounts for which are kept in Individuals and Companies Coal Sales Ledger. The General Ledger carrying only the controlling account or total amount. Individuals and Companies Bills Collectable cover accounts receivable as per Bills Collectable Ledger.

37. Water Supply.—This account is charged with all expense, both labor and supplies for the operation of the water supply plant. This account receives credit for water furnished the various plants.

38. Smithing.—This account is charged with labor and supplies and receives credit for labor performed.

39. Saw Mill.—This account is charged with all labor and supplies to operate and maintain the mill and plant, it receives credit for all lumber, etc., used on a basis of cost per 1000 ft.

40. Depreciation of Animals.—The original cost of all mules and horses is written off in monthly installments, based on the average life of an animal in mine work. This depreciation charge is made to the Hauling account and credited to this account.

41. Profit and Loss.—Into this account are closed the operating and income accounts of the company.

COAL EXPENSE SUB-ACCOUNTS—AUXILIARY RECORDS

1. Expense of Mining.—This account comprises all expense of mining, loading, tramming, tools, etc., and is sub-divided as follows:

- | | |
|-----------------------------------|-----------------------------|
| A. Hand Mining | J. Powder Man |
| B. Contract Mining Machine | K. Check Man |
| C. Day Work Mining Machine | L. Wire Man |
| D. Drilling, Shooting and Loading | M. Shot Inspectors |
| E. Loading company Coal | N. Wood Pulp |
| F. Power house, proportion | O. Earth Tamping |
| G. Ladders and Tool Boxes | P. Tamping and Powder Boxes |
| H. Running Man trip | Q. Interpreter. |
| I. Sharpening Tools | |

2. Hauling.—This account is made up of the following sub-divisions:

- | | |
|-------------------------------|--------------------------------|
| A. Power house, proportion | J. Harness Repairs and Shoeing |
| B. Drivers | K. Cleaning up Wrecks |
| C. Outside Hoistmen | L. Repairs to Haulage Signals |
| D. Underground Hoistmen | M. Clearing Haulage Tracks |
| E. Locomotive Men | N. Oil and Waste |
| F. Rope Runners | O. Roller Repairs and Renewals |
| G. Couplers and Spraggers | P. Repairing Haulage Entries |
| H. Roller Men—Greasers | Q. Loss of Animals |
| I. Stable Expense, proportion | R. Depreciation of Animals. |

3. Loading.—This account comprises the following sub-divisions:

- | | |
|-----------------------------|---|
| A. Outside Foreman's salary | I. Running and Repairing Box-car loader |
| B. Weighmen and Topmen | J. Car handlers |
| C. Pushers and Dumpers | K. Attendance Elevator Screens, etc. |
| D. Couplers and Spraggers | L. Cost of Dummy Doors |
| E. Power House, proportion | M. Unloading Dust and Yard Waste |
| F. Running Chute engine | N. Clearing Yard Tracks |
| G. Loading by day labor | O. Damage to R. R. Cars and Tracks. |
| H. Loading by contract | |

4. Repairs to Cars.—This account comprises the following sub-divisions:

- | | |
|----------------------------|--------------------------------|
| A. Repairing Wrecked cars | C. Replacing lost cars |
| B. Repairing Worn-out cars | D. Replacing wheels and Axles. |

5. Repairs to Track.—This account comprises the following sub-divisions:

- | | |
|---------------------------------|-------------------------------|
| A. Hoist and Locomotive tracks | E. New rails |
| B. Entry and Room Tracks | F. Rail fastenings and Spikes |
| C. Taking up old rails and ties | G. Old rails used. |
| D. New ties used | |

6. Electric Light.—This account comprises the following sub-divisions:

- | | |
|-------------------------------|---------------------------------|
| A. Power house, proportion | C. Replacing Lamps outside |
| B. Repairs to Interior Wiring | D. Replacing lamps in the mine. |

7. Entry Driving.—This account comprises the following sub-divisions:

- | | |
|-----------------------------|-------------------------------------|
| A. Yardage in straight Coal | D. Allowance for boney Coal or rock |
| B. Yardage in Coal and Rock | E. Allowance for rolls |
| C. Yardage in straight Rock | F. Allowance for water. |

8. Rooms and Rolls.—This account comprises the following sub-divisions:

- | | |
|---------------------------------|-------------------------------------|
| A. Rooms turned | D. Allowance for boney Coal or Rock |
| B. Allowance for Rolls in rooms | E. Allowance for water. |
| C. Allowance for Brushing Roof | |

9. Ventilation.—This account comprises the following subdivisions:

- | | |
|-------------------------------------|--------------------------------------|
| A. Power house, proportion | F. Building and Repairing Mine doors |
| B. Gas and Air Inspectors | G. Trappers |
| C. Fan expense and Engineers | H. Cleaning Air Ways |
| D. Building and Repairing Stoppings | I. Repairing Air Ways. |
| E. Brattice Cloth and Bratticing | |

10. Drainage and Watering Mine.—This account comprises the following sub-divisions:

- | | |
|------------------------------|--------------------------|
| A. Power house, proportion | D. Watermen and Supplies |
| B. Outside pumpmen and pumps | E. Ditches and Sumps. |
| C. Inside pumpmen and pumps | |

11. Timber and Props.—This account comprises the following sub-divisions:

- | | |
|-------------------------------------|---------------------------|
| A. Driving Entries and Rooms | E. Unloading and Piling |
| B. Retimbering and Robbing Rooms | F. Hauling and Sowing |
| C. Repairing Haulage entries | G. Loading and delivering |
| D. Repairing Air and Traveling Ways | H. Drawing Props. |

12. Dead Work.—This account comprises the following sub-divisions:

- | | |
|-----------------------------------|----------------------------------|
| A. Retimbering Rooms | E. Dumping and stowing rock |
| B. Regrading and Brushing entries | F. Underground Inspection |
| C. Prospecting Faults | G. Replacing Tools and Repairing |
| D. Loading and Hauling Rock | H. Cleaning Camp. |

13. Repairs to Buildings and Chutes.—This account comprises the following sub-divisions:

- | | |
|---|----------------------------------|
| A. Main Chute and Trestle | E. Barn and Corral buildings |
| B. Crusher Elevator and Screen building | F. Boarding House |
| C. Power and Boiler House | G. Blacksmith and Machine shops |
| D. Engine House | H. Other mine buildings |
| | I. R. R. Tracks and Mine scales. |

14. Repairs to Machinery.—This account comprises the following sub-divisions:

- | | |
|--------------------------------|--|
| A. Boilers and Connections | O. U. G. Air lines |
| B. Steam Lines | P. Outside Electric Power lines |
| C. Stationary steam engines | Q. U. G. Electric Power lines |
| D. Steam hoisting engines | R. Fans and Fan engines |
| E. Electrical hoisting engines | S. Crushers, Elevators, etc. |
| F. Air compressors | T. Tipples and Screens |
| G. Electric Generators | U. Renewal of Wire rope |
| H. Electric Locomotives | V. Mining Machines |
| I. Electric Motors | W. Machinery inspection |
| J. Outside pumps | X. Telephone lines |
| K. U. G. Pumps | Y. Wagons |
| L. Outside Water lines | Z. General Master Mechanic, proportion salary. |
| M. U. G. water lines | |
| N. Outside Air lines | |

15. Superintendence and Clerks.—This account comprises the following sub-divisions:

- | | |
|---|--------------------------|
| A. General and Mine Superintendent's salary, proportion | B. Mine foreman's salary |
| | C. Mine Clerk's salary. |

16. Engineering.—This account comprises the following sub-divisions:

- | | |
|----------------------------------|---------------------|
| A. Mine surveyors and assistants | C. Outside expense. |
| B. Office supplies | |

17. General Expense.—This account comprises the following sub-divisions:

- | | |
|--|--------------------------|
| A. Stationery and Printing, proportion | C. Sundry supplies |
| B. Janitor service | D. Office fixtures |
| | E. Firing office heater. |

18. Incidentals.—This account comprises the following sub-divisions:

- | | |
|---------------------|------------------------------|
| A. Misc. Teaming | E. Watchman |
| B. Pay Day expenses | F. Guard and Special service |
| C. Expense on money | G. Rescue apparatus. |
| D. Free Coal | |

COKE EXPENSE SUB-ACCOUNTS—AUXILIARY RECORDS

40. Coal Used.—To cover the cost of Coal used in making coke.

41. Superintendence and Clerks.—This account comprises the following sub-divisions:

- | | |
|---|--------------------------------------|
| A. General and Mine Supt., salary, proportion | C. Office Clerk's salary, proportion |
| B. Coke Oven Foreman's salary | D. Office supplies, proportion |
| | E. Timekeeper. |

42. Engineering.—This account comprises the following sub-divisions:

- | | |
|--|---------------------------------|
| A. Mine surveyors and assistants, proportion | B. Office supplies, proportion |
| | C. Outside expense, proportion. |

43. Charging Ovens.—This account comprises the following sub-divisions:

- | | |
|--------------------------------|------------------------------------|
| A. Power house, proportion | E. Running Larry cars |
| B. Handling coal at Bins | F. Repairing Larry Cars and Tracks |
| C. Clearing at Bins and Scales | G. Repairing Power and Motor lines |
| D. Weighing charges | H. Repairing Scales. |

44. Burning and Drawing.—This account comprises the following sub-divisions:

- | | |
|--------------------------------|-------------------------------------|
| A. Coke pullers | E. Repairs to Coke oven water lines |
| B. Plastering Oven Doors | F. Repairing Tools |
| C. Power house, proportion | G. Charging Hole Covers. |
| D. Pumping Expense, proportion | |

45. Loading Coke.—This account comprises the following sub-divisions:

- | | |
|------------------------------------|-----------------------------------|
| A. Loading R. R. Cars contract | F. Tool expense and repairs |
| B. Loading R. R. Cars, day labor | G. R. R. Weighman |
| C. Car handlers | H. Cost of Dummy doors |
| D. Clearing R. R. tracks | I. Repairs to R. R. Track scales. |
| E. Damage to R. R. Cars and Tracks | |

46. Loading Cinders.—This account comprises the following sub-divisions:

- | | |
|-------------------------------------|--------------------------------|
| A. Loading and Unloading R. R. Cars | C. Clearing docks |
| B. Hauling in wagons | D. Tool expense and repairs |
| | E. Stable expense, proportion. |

47. Firing Cold Ovens.—This account comprises the following sub-divisions:

- | | |
|--------------|----------------------------------|
| A. Wood used | C. Charging, Burning and Drawing |
| B. Coal used | D. Disposing of cinders. |

48. Repairs to Coke Ovens.—This account comprises the following sub-divisions:

- | | |
|------------------------|---------------------------|
| A. Brick and fire clay | D. Replacing ovens |
| B. Stone Lime, etc. | E. Repairs to dock walls. |
| C. Iron door frames | |

49. Repairs to Buildings.—This account comprises the following sub-divisions:

- | | |
|-------------------------|-------------------------|
| A. Slack bins | D. Trestles and Bridges |
| B. Store and tool house | E. Supt. Office. |
| C. Scale house | |

50. Coke Experiments.—This account comprises the following sub-divisions:

- | | |
|------------------------------|-------------------------------------|
| A. Preparing and Coking coal | C. Cost of Analysis |
| B. Transportation on samples | D. Repairs to laboratory equipment. |

51. Incidentals.—This account comprises the following sub-divisions:

- | | |
|--------------------|-----------------------------------|
| A. Pay day expense | D. Free coal |
| B. Watchman | E. Telephone service and repairs. |
| C. Janitor service | |

CLOSED ACCOUNT

Power House.—This account so-called comprises all the expenses to operate the power plants, both steam generators and steam driven engines, delivering power to the mine plant or workings as Air, Steam or Electricity.

While called an account it does not appear so on the books but is handled in this manner, all labor is charged to the account in the distribution of labor, and is distributed to the various accounts benefited by the steam plant on a basis of power used. This same idea is used in distributing supplies charged to the power house. Power house is merely a charging head under which the different items are gathered, the sum of the labor being further distributed on the same report, and the supplies further distributed on the supply report.

GENERAL OFFICE ACCOUNTING

| | |
|-------------------|-------------------------------|
| Books.—Cash Book | Bills Collectable Ledger |
| Journal | Abstract of Bills Collectable |
| General Ledger | Abstract of Vouchers. |
| Coal Sales Ledger | |

The above are the most important books although there are detailed records covering all expenses kept in auxiliary records.

Cash Book.—The Cash Book is kept by the Treasurer of the company, who pays all bills and handles all finances. All vouchers approved and passed through the company books are transmitted to the Treasurer for payment, by the Auditor. At the end of each month the Treasurer furnishes the Auditor with a detailed statement of all cash receipts and disbursements. This statement is journalized debiting and crediting the proper accounts.

Journal.—All journal entries must be signed by the Chief Clerk as correct and approved by the Auditor, before entered on the books.

Ledger.—The general ledger is kept in the usual way carrying the accounts as outlined in the forepart of this article.

Ledger Coal Sales.—This ledger is subsidiary to the General Ledger, account of Individuals and Companies Coal Sales, carrying the detailed accounts whereas the general ledger account carries the aggregate amount, or controlling account.

Ledger Bills Collectable.—This ledger is subsidiary to the General Ledger, account of Individuals and Companies, Bills Collectable, carrying the detailed accounts, whereas in the General Ledger the account is shown as a whole.

Abstract Bills Collectable.—This book is a journal in which are entered all Bills Collectable, debiting and crediting the proper accounts. These entries are posted in detail to the Bills Collectable ledger and in the aggregate to the general ledger, Individuals and Companies Bills Collectable account.

Abstract of Vouchers.—This book which is very large has various columns that are headed as follows in the rotation given:

| | |
|-------------------------------|-----------------------------|
| Voucher Number | Personal Injury Fund |
| Favor of | Individuals and Companies |
| Amount | Medical Dept. |
| Date transmitted to Treasurer | Boarding house Expenditures |
| Date paid | Boarding house Receipts |
| Material and Supplies | Saw Mill |
| Mine Expenses | Water Supply |
| General Expenses | Pay-roll Deficiency |
| Coke Expenses | Smithing Account |
| Earnings | Unadjusted Legal Expense |
| Rents | Unclaimed Wages |
| Depreciation of Animals | Profit and Loss. |

Under each heading above given there are separate sub-heads for each mine. All Vouchers are entered in numerical order, and forwarded to the Treasurer for payment.

The following statements, etc., pass through the Voucher Abstract besides Vouchers.

| | |
|---------------------------|-----------------------------------|
| Pay-rolls | Material and Supplies used report |
| Pay-roll Distribution | Abstract of Journal entries |
| Pay-roll Deduction Report | Abstract of Bills Collectable. |

[illegible]

FIG. 147.—FORM 1.

At the end of the month a recapitulation of the Abstract of Vouchers is made following the last entry for the month. As both debits and credits are entered in the Voucher Abstract for the different accounts, two colors of ink are necessary, black for the debits and red for the credits. The net totals of the recapitulation are posted to the General Ledger.

Invoices.—All invoices come to the Purchasing Agent who checks the prices and terms, after which they are forwarded to the proper mine to be checked by the supply clerk, as to receipt of material and for entry on the mine records, where they are charged to Material and Supplies or direct to accounts benefited, and then forwarded to the Auditor who

vouchers them and passes them on to the Treasurer for payment. All invoices are entered in an Invoice Record by the Auditor, separate accounts being kept with each individual or company from whom material is purchased. This record is to group all transactions with each firm or individual for quick reference.

[illegible]

FIG. 148.—FORM 2.

Vouchers.—All invoices are Vouchered for payment. These Vouchers (Fig. 147) must be certified to as correct by the Chief Clerk and approved by the General Manager and Auditor before being passed to the Treasurer for payment. All Vouchers are entered in the Abstract of Vouchers and the charges distributed to the proper mines, under the various account headings shown in that book.

Extraordinary Expenses.—All Extraordinary Expenses which are estimated to cost \$100.00 or more, require the approval of the General Manager and General Superintendent. The method of handling these items is to make out at the mine an estimate of the required work on form 2 (Fig. 148) in quadruplicate, giving the details regarding the location and necessity of the work, also detailed estimates. These estimates pass through the General Superintendent to the General Manager for approval; after being approved the work may be started. The disposition of these forms is printed at the bottom of the form.

| | | |
|---|----------|------------------------|
| Utah Fuel Company Pleasant Valley Coal Company | Form 243 | Appropriation No. |
|---|----------|------------------------|

ESTIMATE OF IMPROVEMENTS, ETC.

ALL NEW WORK OR BETTERMENTS TO BE AUTHORIZED ON THIS BLANK BEFORE WORK IS COMMENCED. TO BE MADE IN DUPLICATE.

| | |
|---|------------------------------------|
| Gen'l Mgr. Dep't. No. | Utah, 190 |
| Gen'l Sup't " " | |
| Land " " | |
| 1. Location | |
| 2. Title | |
| | |
| 3. General description | |
| | |
| | |
| 4. New work or betterments | |
| 5. Necessity for same | |
| | |
| 6. Estimate of Cost: Labor, \$ | Material, \$ Total, \$ |
| 7. Work should be commenced | |
| | |
| 8. Length of time required to complete work | |
| 9. To be charged to | |
| | |

| | |
|--|---|
| | Approved |
| | <div style="display: flex; justify-content: space-around;"> Gen'l Superintendent. Gen'l Manager. </div> |

| | | | |
|----------------------|-----------|----------------------|-----------|
| Date Commenced | 190 | Date Completed | 190 |
|----------------------|-----------|----------------------|-----------|

| | |
|--|---|
| ESTIMATED COST { Labor, \$ { Material, \$ Total, \$ | ACTUAL COST { Labor, \$ { Material, \$ Total, \$ |
|--|---|

| | |
|--------------------|-----------------------------------|
| Increase, \$ | Per Cent |
| | Decrease, \$ Per Cent |

APPLICATIONS TO BE TRANSMITTED AS FOLLOWS:

- 1st—Original and Duplicate to General Manager for approval.
- 2d—Original to General Superintendent and Duplicate to Auditor.
- 3d—Original to Auditor when work is completed to be checked and returned to General Superintendent through General Manager.

FIG. 149.—FORM 3.

Improvements.—All expenditures for Additions to Plant and Improvements require a special appropriation if the amount involved exceeds \$100.00. An estimate of the work contemplated is made out on form 3 (Fig. 149), in duplicate by the mine Supt., and forwarded to the General Manager, through the General Supt. for approval. The General Manager makes out an "Appropriation for Improvements," form 4 (Fig. 150), in triplicate and forwards it to the Vice President for approval; after being approved the work may be started. The disposition of the form is explained on the form itself. Copies of all

DUPLICATE

Appropriation No.

APPROPRIATION FOR IMPROVEMENTS

ALL NEW WORK OR BETTERMENTS TO BE AUTHORIZED ON THIS BLANK BEFORE WORK
IS COMMENCED. TO BE MADE IN TRIPLICATE

To the Second Vice President,Utah,190.....
Denver, Colorado.
 I would respectively recommend an appropriation for improvements described below, with details
 attached, and request your approval of the same:
 Gen'l Sup't Dep't No.
 Land

1. Location
2. Title

3. General description.....

4. New work or betterments.....
5. Necessity for same.....

6. Estimate of Cost: Labor, \$.....Material, \$.....Total, \$.....
7. Work should be commenced.....
8. Length of time required to complete work.....
9. To be charged to.....

Approved:

Second Vice President

.....190.....

Date Commenced.....190.....

General Manager

.....190.....

Date Completed.....190.....

ESTIMATED COST { Labor, \$.....

{ Material, \$.....Total, \$.....

ACTUAL COST { Labor, \$.....

{ Material, \$.....Total, \$.....

Increase, \$.....Per Cent.....Decrease, \$.....Per Cent.....

APPLICATIONS TO BE TRANSMITTED AS FOLLOWS:

- 1st—Original, Duplicate and Triplicate to Second Vice President for approval.
- 2d—Original and Duplicate to General Manager when approved.
- 3d—Original to Auditor to be checked and returned to General Manager when work is completed.

FIG. 150.—FORM 4.

Form 472-10-28-10—2m-R. P.

UTAH FUEL COMPANY
INCLUDING
PLEASANT VALLEY COAL COMPANY

Statement of Expenditures for Additions to Plant, Improvements, Etc.

at Mines 191

| DETAILS | Req. No. | From Vouchers | Pay-rolls | Material | Totals |
|---------|----------|---------------|-----------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

FIG. 151.—FORM 5.

C. P. Co. 10-14-04—500

UTAH FUEL COMPANY
INCLUDING
PLEASANT VALLEY COAL COMPANY

Statement of Expenditures for Additions to Plant, Improvements, Etc.,

authorized to 190 at Mines,
showing amount expended to date and amount to be expended to complete same.

| Class of Work Authorized | Req. No. | Estimated Cost | Amount Expended to 19 Inclusive | Balance to be Expended to Complete |
|--------------------------|----------|----------------|---|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

FIG. 152.—FORM 6.

"Appropriations" go to the Auditor, who opens separate accounts with each one in the auxiliary records.

At the end of each month a statement form 5 (Fig. 151), is made up for each mine, listing the various appropriations for Improvements, Additions to Plant, etc., and showing against each one the expenditures for the month. These expenditures are sub-divided as follows: Vouchers, Pay-rolls, Material and Total.

Another statement is made up each month for each mine, listing each appropriation made during the fiscal year, the nature of the work authorized, the estimated cost, amount expended to date, and the balance of the appropriation available to complete the work. See form 6 (Fig. 152).

Transfer of Equipment, Supplies, Etc.—As it frequently happens that it is advisable to transfer material from one mine to another, a proper record of the transfer is necessary, and to facilitate matters a "Transfer Letter" (form 7, Fig. 153) is made out in triplicate by the mine supt. shipping the material in question, giving the details of the material transferred. The original copy is forwarded to the Auditor, and the duplicate and triplicate to the consignee. Upon receipt of

Form 506-11-1-10-1m-R. P.

TRANSFER LETTER

Mr. 191

Mine Superintendent

Dear Sir:

The following items have been reported to Auditor, as a charge to your mine, month of 191

Charge M. & S. Acct. \$
Credit M. & S. Acct. \$

Total . . . \$

I have also charged your mine direct from our pay-rolls, as follows:

.....

.....

.....

Checked and Accepted Yours truly,
.....
Mine Superintendent Mine Superintendent

NOTE: Instructions from Auditor.
Charges to your various M. & S. Acct's should be charged out on your monthly M. & S. Report just as soon as material is used, giving reference to source of charge.
Direct charges from other mine pay-rolls to your M. & S. Acct. you will take up and charge out as used, but charges to Underground Inspection, B. & B. H. Expenses, or any other account but M. & S. Acct., is taken up by the Auditor and charged to the proper account.

FIG. 153.—FORM 7.

material the receiving Supt. will O. K. the duplicate copy and forward to the Auditor.

Depreciation.—The Coal Lands of the company are depreciated or written off on a basis of acreage worked out each year. That is to say that the total cost of the coal lands of each mine represents an average value per acre, and as the depreciation is not considered until the mine is on a permanent producing basis, it is only necessary to estimate the number of acres that will be exhausted at the end of the year to arrive at the proper amount to write off during the year. This amount is pro-rated one-twelfth each month to Depreciation of General Plant A/c. Any inaccuracies that may be made in estimating the amount that is written off during the year is adjusted during the following year.

Depreciation of Plant Buildings, etc., is charged and credited as above, in addition to charge for acreage worked out.

Depreciation of Plant Account is estimated on a basis of the life of the mine and is dependable on the production. At the time the mine is placed on a permanent producing basis the plant account will represent an average amount per acre, as depreciation is figured from the estimated acreage to be worked out during the year, the amount to be written off during the year is arrived at by multiplying the average plant expenditures per acre by the estimated acreage to be exhausted during the year. This amount is pro-rated one-twelfth each month to Sinking Fund Installment and credited to Depreciation Account. As the Plant Account varies from year to year, by the expenditure of additional capital for additions, improvements, etc., it is necessary to adjust this account each year.

Details of General Expenses.—In order that an accurate detailed record may be kept of all expenditures and segregated so as to show each account, sub-account also each appropriation, this detail of General Expenses is kept. The expenditures are posted each month to these accounts from the Pay-rolls, Vouchers, Report of Material and Supplies.

REPORTS, ETC., RECEIVED FROM THE MINES

Pay-rolls
Pay-roll Deductions
Pay-roll Distribution
Boarding House Report
Rent Statement
Animals Killed and Sold
Pay-roll Deficiency List
Unclaimed Wages List
Supplies Used Report
Daily Report Mine Operations
Daily Report Coke Oven Operations
Average Report of Operations

Weighmaster's Report
Daily Shipping Report
Report of Coal Mined—Distribution
Report of Hay and Grain
Nationalty Report
Statement of Local Coal sales.

Pay-rolls.—All Pay-rolls are received from the mines as soon after the end of the month as they are completed. These Pay-rolls are entered in the Abstract of Vouchers and charged to accounts receiving benefit as shown by Distribution of Pay-rolls, and credited to Pay-rolls. When paid the amount is credited to the Treasurer and charged to Pay-roll account.

Pay-roll Deductions.—These reports are entered in the Abstract of Vouchers the total amount of deductions that go as credit to company ledger accounts are charged to Pay-roll account and the other deductions are charged to their proper accounts.

Boarding-house Reports.—These reports are checked up with the debit and credit charges on the books and the free board furnished is charged to mine expense account and credited to Boarding-house Receipts.

Animals Killed and Sold.—The debits and credits as shown by these reports are journalized, the value of Animals killed or sold being credited to the Animals Killed and Sold account and charged to Hauling. The cost of Animals purchased would be charged to that account thus making the same entries as appear on the mine books.

Unclaimed Wages.—These reports list the individuals and amount due them in wages that remain unclaimed on pay day and are returned to the General Office with the amount in cash. These wages are placed to the credit of the Unclaimed Wages account by journal entry and charged to the Treasurer.

Supplies Used Report.—These reports are passed through the abstract of Vouchers and charged to the various mine accounts, the total being credited to Material and Supply account.

Daily Shipping Report.—These reports cover the shipment of all Coal and Coke and are received daily. They are recapitulated, showing the tonnage of Coal and Coke, also the accrued earnings for the same. Journal entries are made from these reports charging consignees and crediting earnings with the amounts shown.

REPORTS MADE AT THE GENERAL OFFICE

Supplies.—A statement of the Material and Supply account is made up each month (form 8, Fig. 154) by the Auditor. This statement shows the balance of the account at the first of the month and all debits to the account. The credits are itemized showing the totals as charged to the

different accounts. All journal entries effecting the Material and Supply account are also shown.

Recapitulation of Shipments.—This record is made up on form 9 (Fig. 155) from the Daily Reports of Shipments received from each mine each day. The shipments are shown according to grade, the weight and estimated earnings being also shown.

| UTAH FUEL COMPANY | | | | | | | | | |
|--|--|------------------------|--|-------------------------|--|--|--|--|--|
| Statement of Material and Supplies Account | | | | | Mine No. _____ for Month of _____ 19__ | | | | |
| Balance from Last Month | | MINE EXPENSES | | Rents | | | | | |
| Total Charges from Vouchers | | Mining | | Coal Sales at Mine | | | | | |
| Labor from Pay Rolls | | Hauling | | B. & S. H. Expenses | | | | | |
| Coal to Boilers, Etc. | | Loading | | B. & S. H. Fixtures | | | | | |
| Transferred from | | Repairs to Cars | | Ind'ls and Co.'s | | | | | |
| | | Repairs to Tracks | | Bills Collectible | | | | | |
| | | Electric Light | | Medical Dep't. | | | | | |
| | | Entries | | | | | | | |
| | | Rooms | | | | | | | |
| | | Ventilation | | | | | | | |
| | | Watering | | | | | | | |
| | | Timber and Props | | | | | | | |
| | | Dead Work | | CAPITAL CHARGES | | | | | |
| | | Rep. Bldgs. and Chutes | | T.O. and Frictions | | | | | |
| | | Repairs Machinery | | Cars and Tracks | | | | | |
| | | Supt. and Clerks | | Power and Machinery | | | | | |
| | | Engineering | | Buildings | | | | | |
| | | General Expenses | | Mine Development | | | | | |
| | | Incidentals | | | | | | | |
| | | Total Mine Expenses | | | | | | | |
| | | COKE EXPENSES | | CHARGES TO OTHER MINES | | | | | |
| | | Coal Used | | Winter Quarters M. & S. | | | | | |
| | | Supt. and Clerks | | Cattle Gate M. & S. | | | | | |
| | | Engineering | | Clear Creek M. & S. | | | | | |
| | | Charging Ovens | | Sunnyside M. & S. | | | | | |
| | | Burning and Drawing | | Somerset M. & S. | | | | | |
| | | Loading Coke | | | | | | | |
| | | Loading Cinders | | | | | | | |
| | | Firing Cold Ovens | | | | | | | |
| | | Reps. Coke Ovens | | Total Miscellaneous | | | | | |
| | | Reps. to Buildings | | No. Mine Coal Exp. | | | | | |
| | | Coke Experiments | | No. Mine Coal Exp. | | | | | |
| | | Incidentals | | Total Coke Expense | | | | | |
| | | Total Coke Expenses | | Balance on Hand | | | | | |
| TOTAL | | | | TOTAL | | | | | |

FIG. 154.—FORM 8.

Tonnage and Earnings.—A weekly statement is made out by the Auditor showing the estimated tonnage and earnings, this year, last year and the increase or decrease. (Form 10, Fig. 156.)

Cost Sheet Coke Ovens.—A detailed report of operations at the Coke Ovens is made up each month, showing the expenditures against each account and sub-account. These charges are divided, showing labor and material separate. The information for this Cost Sheet is taken from the Pay-roll distribution, Report of Material and Supplies Used and the Production record. (See form 118, Fig. 157.)

| RECAPITULATION | | | | | | | | | |
|---|--------|----------|--------|----------|--------|----------|--------|----------|------------|
| Of Daily Report of Shipments from _____ Mine, Month of _____ 19__ | | | | | | | | | |
| Date | LUMP | | ENGINE | | NUT | | BLAKE | | TOTAL COAL |
| | Pounds | Earnings | Pounds | Earnings | Pounds | Earnings | Pounds | Earnings | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| Total | | | | | | | | | |
| Total | | | | | | | | | |
| Total | | | | | | | | | |
| Total | | | | | | | | | |

FIG. 155.—FORM 9.

UTAH FUEL
PLEASANT VALLEY
DETAILED REPORT OF OPERATING EXPENSES AT

| COAL EXPENSES | LABOR | MATERIAL | COAL EXPENSES | LABOR | MATERIAL |
|-------------------------------------|-------|----------|--|-------|----------|
| 1 EXPENSE OF MINING | | | 9 VENTILATION | | |
| Hand Mining | | | Proportion Power House Expense | | |
| Contract Machine Mining | | | Gas and Air Inspectors | | |
| Day Work Machine Mining | | | Fan Expenses and Engineer | | |
| Drilling, Shooting and Loading | | | Building and Repairing Stoppings | | |
| Loading Company Coal | | | Brattice Cloth and Bratticing | | |
| Proportion Power House Expense | | | Building and Repairing Mine Doors | | |
| Ladders and Tool Boxes | | | Trappers | | |
| Running Man Trip | | | Cleaning Air Ways | | |
| Sharpening Tools | | | Repairing Air Ways | | |
| Powder Man | | | | | |
| Check Man | | | 10 DRAINAGE AND WATER'G MINE | | |
| Wire Man | | | Proportion Power House Expense | | |
| Shot Inspectors | | | Outside Pumps and Pumpmen | | |
| Wood Pulp | | | Inside Pumps and Pumpmen | | |
| Earth Tamping | | | Water Men and Supplies | | |
| Tamping and Powder Boxes | | | | | |
| Interpreter | | | | | |
| | | | 11 TIMBER AND PROPS | | |
| 2 HAULING | | | Driving Entries and Rooms | | |
| Proportion Power House Expense | | | Retimbering and Robbing Rooms | | |
| Drivers | | | Repairing Haulage Entries | | |
| Outside Holstmen | | | Repairing Air and Traveling Ways | | |
| Underground Holstmen | | | Unloading and Piling | | |
| Locomotive Men | | | Hauling and Sawing | | |
| Rope Runners | | | Loading and Delivering | | |
| Couplers and Spraggers | | | Drawing Props | | |
| Roller Men and Greasers | | | | | |
| Proportion Stable Expense | | | 12 DEAD WORK | | |
| Harness Repairs and Shoeing | | | Retimbering Rooms | | |
| Clearing up Wrecks | | | Regrading and Brushing Entries | | |
| Repairs Haulage Signals | | | Prospecting Faults | | |
| Cleaning Haulage Tracks | | | Loading and Hauling Rock | | |
| Roller Repairs and Renewals | | | Dumping and Stowing Rock | | |
| Repairing Haulage Entries | | | Underground Inspection | | |
| Depreciation of Animals | | | Repairing and Replacing Co. Tools | | |
| | | | | | |
| 3 LOADING | | | 13 REPAIRS TO BLDGS. & CHUTES | | |
| Outside Foreman's Salary | | | Main Chute and Trestle | | |
| Weighmen and Topmen | | | Crusher, Elevator & Screen Build'g | | |
| Fishers and Dumpers | | | Power and Boiler Houses | | |
| Couplers and Spraggers | | | Engine House | | |
| Proportion Power House Expense | | | Barn and Corral Buildings | | |
| Running Chute Engine | | | Boarding Houses | | |
| Loading by Day Labor | | | Blacksmith and Machine Shops | | |
| Loading by Contract | | | Other Mine Buildings | | |
| Bunn & Boy's Box Car Loader | | | R. R. Track and Mine Scales | | |
| Car Handlers | | | | | |
| Attendance Elevators, Screens, etc. | | | | | |
| Cost Dummy Doors | | | 14 REPAIRS MACHINERY | | |
| Unloading Dust and Yard Waste | | | | | |
| Cleaning Yard Tracks | | | | | |
| Damage to R. R. Cars and Tracks | | | | | |
| | | | | | |
| 4 REPAIRS TO CARS | | | | | |
| Repairing Wrecked Cars | | | | | |
| Repairing Worn Out Cars | | | | | |
| Replacing Lost Cars | | | | | |
| Replacing Wheels and Axles | | | | | |

Fig. 158.—Form 110.

COMPANY
COAL COMPANY

.....MINE, MONTH OF.....

| COAL EXPENSES | LABOR | MATERIAL | COKE EXPENSES | LABOR | MATERIAL |
|--|--------------|-----------------|---|-----------------------|---------------------|
| 41 ENGINEERING | | | 45 REPAIRS TO COKE OVENS | | |
| Mine Surveyors and Assistants | | | Brick and Fire Clay | | |
| Office Supplies | | | Stone, Lime, etc. | | |
| Outside Expenses | | | Cast Iron Door Frames | | |
| | | | Repacking Ovens | | |
| | | | Repairs Dock Walls | | |
| 47 GENERAL EXPENSES | | | | | |
| Proportion Stationery and Printing | | | 49 REPAIRS TO BUILDINGS | | |
| Janitor Service | | | Sack Bins | | |
| Sundry Supplies | | | Store and Tool House | | |
| Office Fixtures | | | Scale House | | |
| Firing Office Heater | | | Trestles and Bridges | | |
| | | | Superintendent's Office | | |
| | | | | | |
| 49 INCIDENTALS | | | 50 COKE EXPERIMENTS | | |
| Miscellaneous Tamping | | | Preparing and Coking Coal | | |
| Pay Day Expenses | | | Transportation on Samples | | |
| Express on Money | | | Cost of Analysis | | |
| Free Coal | | | | | |
| Watchman | | | 51 INCIDENTALS | | |
| Guard & Special Service Expenses | | | Pay Day Expenses | | |
| | | | Watchman | | |
| | | | Janitor Service | | |
| | | | Free Coal | | |
| | | | Telephone Service and Repairs | | |
| | | | | | |
| COKE EXPENSES | LABOR | MATERIAL | RECAPITULATION | | |
| 40 COAL USED | | | SHOWING COST PER TON COAL AND COKE | | |
| Tons @ | | | COAL EXPENSES | | |
| | | | ACCOUNTS | TOTAL EXPENSES | COST PER TON |
| | | | | THIS YEAR | LAST YEAR |
| | | | | CENTS | CENTS |
| 41 SUPERINTENDENTS & CLERKS | | | Expense of Mining | | |
| Prop's Gen. & Mine Sup't's Sal's & Exp's | | | Hauling | | |
| Coke Oven Foreman | | | Loading | | |
| Proportion Office Clerks | | | Repairs to Cars | | |
| Proportion Office Supplies | | | Repairs to Tracks | | |
| Timekeeper | | | Electric Light | | |
| | | | Entry Driving | | |
| 42 ENGINEERING | | | Rooms and Rolls | | |
| Mine Surveyors and Assistants | | | Ventilation | | |
| Office Supplies | | | Drainage & Watering Mine | | |
| Outside Expenses | | | Timber and Props | | |
| | | | Dead Work | | |
| | | | Repairs to Bldgs. and Chutes | | |
| | | | Repairs Machinery | | |
| | | | Engineering | | |
| 43 CHARGING OVENS | | | General Expense | | |
| Proportion Power House Expense | | | Incidentals | | |
| Handling Coal at Bins | | | | | |
| Cleaning at Bins and Scales | | | | | |
| Weighing Charges | | | | | |
| Running Lorry Cars | | | | | |
| Repairing Lorry Cars and Tracks | | | | | |
| Repairing Motor and Power Lines | | | | | |
| Repairing Scales | | | | | |
| | | | | | |
| 44 BURNING AND DRAWING | | | | | |
| Coke Pullers | | | | | |
| Fluentering Oven Doors | | | | | |
| Proportion Power House Expense | | | | | |
| | | | RUN OF MINE COAL | THIS YEAR | LAST YEAR |
| | | | Tons Coal Mined | | |
| | | | Days Mine Worked | | |

Fig. 158.—Continued.

(FIG. 158.—*Concluded.*)

[illegible]

Cost Sheet Mine.—A detailed report of operations for each mine is made up each month showing the cost of operations for each account and sub-account both Coal expense and Coke expense. These charges are divided, labor and supplies being shown separately. The information for these cost sheets is taken from the Pay-roll Distribution, Report of Material and Supplies Used, and the Production Record. See form 12, Fig. 158.

Monthly Report of Operations.—This report (form 13, Fig. 159) is made out in triplicate at the end of each month, the duplicate copy going to the General Manager. The report covers statistics of Force Employed, Expenses, Cost per ton, Output, etc., for all mines of the company.

Comparative Statement of Operations.—This statement (form 14, Fig. 160) is made up each month covering all mines and coke plants as to Production, Earnings, Expenses, etc., for each mine and coke plant. A distribution of product, both coal and coke is also shown and the earnings on the same. The information for this statement is taken from the general ledger accounts and the production record.

Financial Statement.—At the end of each month, after the general books have been closed this statement is made out in the following form:

(FIG. 158.—*Concluded.*)

[illegible]

UTAH FUEL COMPANY

Exhibit.....19....

INCOME ACCOUNT

For month of.....

| | |
|---|--------------|
| Gross earnings from sale of Coal and Coke | \$..... |
| Operating Expenses | ..... |
| Total net earnings from mines | ..... |
| Add receipts from miners houses, etc. | ..... |
| Interest, discount and exchange | ..... |
| TOTAL INCOME. | ..... |
| Deduct fixed charges, etc. | ..... |
| Taxes Nevada | ..... |
| Insurance | ..... |
| Personal Injury Claims | ..... |
| Coal Prospecting | ..... |
| Depreciation of Gen. Plant account | ..... |
| NET INCOME. | ..... |

GENERAL PROFIT AND LOSS ACCOUNT

| | | |
|--|-------|-------|
| By income as above | ..... |  |
| To | ..... | ..... |
| Balance | ..... | ..... |
| Balance to credit of Profit and Loss account | ..... | ..... |
| month of..... | | |

INCOME ACCOUNT

| | | |
|---|-------|--|
| Fiscal year to date | | |
| From June 1.....to..... | | |
| Gross Earnings from sale of Coal and Coke | ..... |  |
| Operating Expenses | ..... |  |
| Total net earnings from mines | ..... |  |
| Add receipts from miners houses | ..... |  |
| Interest Discount and Exchange | ..... |  |
| Total Income | ..... |  |
| Deduct fixed charges | | |
| Taxes Nevada | ..... |  |
| Insurance | ..... |  |
| Personal Injury Claims | ..... |  |
| Coal Prospecting | ..... |  |
| Depreciation of General Plant account | ..... |  |
| NET INCOME | ..... |  |

GENERAL PROFIT AND LOSS ACCOUNT

| | | |
|--|-------|--|
| Balance to credit of Profit and Loss account | ..... |  |
|30..... | ..... |  |
| Income as above.....months | ..... |  |
| Balance | ..... |  |
| Balance at the credit of Profit and Loss account | ..... |  |
| | | |

BALANCE SHEET

| | | |
|--|-------|--|
| Current Assets. | | |
| Material and Supplies | ..... |  |
| Engineering Property | ..... |  |
| Cash in Treasury | ..... |  |
| Due from Indvs. and Comps. Coal sales | ..... |  |
| Due from Indvs. and Comps. Bills Collectible | ..... |  |
| Bills Receivable | ..... |  |
| Fire Insurance (not charged out) | ..... |  |
| Pay-roll overdrafts | ..... |  |
| Current Liabilities. | | |
| Vouchers | ..... |  |
| Pay-rolls | ..... |  |
| Unclaimed Wages | ..... |  |
|R. R. Co., for freight | ..... |  |
| on.....tons Coal | ..... |  |
| Taxes Nevada payable | ..... |  |

General Accounts.

| | | |
|-----------------------------------|-------|--|
| Cost of Property | ..... |  |
| Additional Expenditures | ..... |  |
| Lands, Swan Creek | ..... |  |
| Machinery for General Prospecting | ..... |  |
| Saloon buildings | ..... |  |
| Boarding house fixtures | ..... |  |
| Less Depreciation | ..... |  |
| Capital Stock | ..... |  |

Deferred Accounts,

| | | |
|-------------------------|---------|---------|
| Personal Injury Fund | ..... |  |
| Animals Killed and Sold | ..... |  |
| Special Renewal Fund | ..... |  |
| Profit and Loss | ..... |  |
| | \$..... | \$..... |

DETAILS OF ADDITIONAL EXPENDITURES

.....19.....to.....19....

Accounts,

| | | |
|------------------------------|-------|--|
| Lands | ..... |  |
| Tramways Chutes and Trestles | ..... |  |
| Cars and Tracks | ..... |  |
| Power and Machinery | ..... |  |
| Buildings | ..... |  |
| Mine Developments | ..... |  |

MINE OFFICE ACCOUNTING

Timekeeping.—Both outside and inside foremen are supplied with pocket Time Books (form 15, Fig. 161). These books are designed for one month's use, each employee being assigned a page each month

|191..... | | |
|---------------|--|------------|
| DATE | | OCCUPATION |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| | | |
| 27 | | |
| 28 | | |
| 29 | | |
| 30 | | |
| 31 | | |

FIG. 161.—FORM 15.

All pit cars are weighed by the weighman as they come out of the mine. These weights are entered on a Tonnage Bulletin (form 18, Fig. 164). For the information of the miners this bulletin is posted up at the mine office after each day's run, so that each man may know just what his output has been for the day. In entering the cars on this bulletin, the tonnage of each man is entered under the check number that has been assigned him. The earnings of each man each day, who is working on a tonnage basis is posted from this bulletin to the time book.

Record of Yardage.—Employees working on a yardage basis have their work measured up at the end of each month by the Supt., or mine engineer. These measurements are turned into the office, showing place, Feet, Yards, Rate of pay, and whether the yardage has been made in rooms, entries or other openings, and the employee to receive credit for the yardage. This record is entered in the Record of Yardage book, form 19 (Fig. 165), and is the basis on which contract miners are paid.

[illegible]

FIG. 165.—FORM 19.

Record of Coal Mined.—This book, form 20 (Fig. 166), which is used for the purpose of keeping an individual account with each employee who is working contract, either on a tonnage or yardage basis, is posted up each day. The tonnage figures are taken from the Tonnage Bulletin, the yardage from the Yardage Record at the end of the month. The charges against employees such as Coupons are posted each day, charges for Rent and Medical Dept., are posted the first of the month, and charges for Material, Fuel, Smithing and Board are posted at the end of the month.

Labor Distribution.—The Distribution of Labor for all employees is made by their foremen at the time their time for the day is entered in the

Time Book (form 15, Fig. 161). It will be noted that the Time Book is designed specially with this feature in mind, a division of each man's labor being shown for each day. This Distribution of Labor, of course, is made out according to the schedule of accounts and sub-divisions thereof called for by the mine books. This distribution as furnished by the foremen is a plain statement as to what the men are doing and a division

[illegible]

FIG. 166.—FORM 20.

of their time in accordance therewith. When this distribution is reported to the Mine Clerk for entry in the Office Time Book, he will also show in connection with the information furnished by the foremen, the account or sub-division chargeable, and rate of pay therefore. At the end of the month the time and earnings are extended in the Office Time Book for each job. This Office Time Book furnishes not only a record of the time but also a distribution of labor for each employee.

Pay-roll.—The Pay-roll, form 2 (Fig. 167), is made up from the Time Book and the Record of Coal Mined book. Employees names are entered

tance. The Treasurer will make an entry in his books charging "Unclaimed Wages" and crediting Cash with the amount.

| | | |
|---|--|--------|
| Form 438-B 2-15-10 5M | Roll _____ Name _____ Ck _____ | |
| NOT TRANSFERABLE | | |
| Sign in Ink PERSONALLY and Present on PAY DAY | | |
| Statement for Month of _____ | | 19____ |
| IN ACCOUNT WITH UTAH FUEL COMPANY AT CASTLE GATE MINES | | |
| Labor _____ " _____ " _____ " _____ Diving Entry _____ " _____ Turning Rooms _____ Cars _____ " _____ | Days, @ _____ Hours, @ _____ Trips, @ _____ Ovens, @ _____ Yards, @ _____ " @ _____ Tons. @ _____ " @ _____ | |
| TOTAL EARNINGS | | |
| Medical Department _____ Smithing _____ Fuel and Material _____ House and Ground Rent _____ Board _____ Insurance _____ Coupons, Current Month _____ Coupon Balance last Month _____ | | |
| TOTAL EXPENSES | | |
| BALANCE | | |
| Received payment in full of above account | | |
| _____ 19____ | | |
| Sign here _____ | | |
| Witness _____ | | |

FIG. 168.—FORM 22.

Pay-roll Deductions.—A detailed statement of deductions made on the Pay-roll is made up in duplicate and a copy forwarded to the Auditor with the Pay-roll. This statement form 23 (Fig. 169) shows deductions made, and the deductions set out in detail. On the reverse side of the sheet the deductions are summarized. The statement is journalized, crediting Pay-roll with the gross amount and debiting sundry accounts with the distribution.

[illegible]

Fig. 169.—Form 23.

UTAH FUEL COMPANY

Form 469
2-22-11 500

| Distribution of Pay-rolls at | | Mine No. | | For Month of 191..... | |
|--|--|--|--|---|--|
| COAL EXPENSES | | COAL EXPENSES | | COAL EXPENSES | |
| 1 EXPENSE OF MINING | | Harness Repairs and Shoeing Clearing up Wrecks Repairs Haulage Signals Cleaning Haulage Tracks Roller Repairs and Renewals Repairing Haulage Entries | | 4 REPAIRS TO CARS | |
| Contract Machine Mining Day Work Machine Mining Drilling, Shooting and Loading Loading Company Coal Ladders and Tool Boxes Running Man Trip Sharpening Tools Powder Man Check Man Wire Man Shot Inspectors Earth Tamping Tamping and Powder Boxes Interpreter | | 3 LOADING | | 5 REPAIRS TO TRACKS | |
| 2 HAULING Proportion Power House Expense Drivers Outside Hoistmen Underground Hoistmen Locomotive Men Rope Runners Couplers and Spraggers Roller Men and Greasers Proportion Stable Expense | | Outside Foreman's Salary Weighmen and Topmen Pushers and Dumpers Couplers and Spraggers Proportion Power House Expense Running Chute Engine Loading by Day Labor Loading by Contract Runn'g & Rep'ng Box Car Loader Car Handlers Attendance Elevators, Screens, etc. Cost Dummy Doors Unloading Dust and Yard Waste Cleaning Yard Tracks Damage to R. R. Cars and Tracks | | Hoist and Locomotive Trucks Ordinary Entry and Room Tracks Taking up Old Rails and Ties | |
| | | | | 6 ELECTRIC LIGHT | |
| | | | | Proportion Power House Expense Repairs Interior Wiring | |
| | | | | 7 ENTRY DRIVING | |
| | | | | Yardage in Straight Coal Yardage in Coal and Rock Yardage in Straight Rock | |

Fig. 170.

| COAL EXPENSES | | COAL EXPENSES | | COAL EXPENSES | |
|--|--|--|--|---|--|
| Allowance for Boney Coal or Rock Allowance for Rolls Allowance for Water | | 11 TIMBER AND PROPS | | 14 REPAIRS MACHINERY | |
| 8 ROOMS AND ROLLS Rooms Turned Allowance for Rolls in Rooms Allowance for Brushing Roof Allowance for Boney Coal or Rock Allowance for Water | | Driving Entries and Rooms Retimbering and Robbing Rooms Repairing Haulage Entries Repairing Air and Traveling Ways Unloading and Piling Hauling and Sawing Loading and Delivering Drawing Props | | Boilers and Connections Steam Lines Stationary Steam Engines Steam Hoisting Engines Electric Hoisting Engines Air Compressors Electric Generators Electric Locomotives Miscellaneous Electric Motors Outside Pumps Underground Pumps Outside Water Lines Underground Water Lines Outside Air Lines Underground Air Lines Outside Electric Power Lines Underground Electric Power Lines Fans and Fan Engines Proportion Crushers, Elevators, etc. Tipples and Screens Renewal Wire Ropes Mining Machines Machinery Inspection Telephone Lines Wagons Prop'n Salary Gen'l Master Mech. | |
| 9 VENTILATION Proportion Power House Expense Gas and Air Inspectors Fan Expenses and Engineer Building and Repairing Stoppings Brattice Cloth and Bratticing Building and Repairing Mine Doors Trappers Cleaning Air Ways Repairing Air Ways | | 12 DEAD WORK | | | |
| | | Retimbering Rooms Re-grading and Brushing Entries Prospecting Faults Loading and Hauling Rock Dumping and Stowing Rock Underground Inspection Repairing Company Tools Cleaning Camp | | 13 REPAIRS TO BLDGS. AND CHUTES | |
| 10 DRAINAGE AND WATER'G MINE Proportion Power House Expense Outside Pumps and Pumpmen Inside Pumps and Pumpmen Water Men and Supplies Ditches and Sumps | | Main Chute and Trestle Crusher, Elevator and Screen Bldg. Power and Boiler Houses Engine House Barn and Corral Buildings Boarding Houses Blacksmith and Machine Shops Other Mine Buildings R. R. Track and Mine Scales Hospital | | 15 SUPERINTENDENTS AND CLERKS | |
| | | | | Prop'n Gen. and Mine Supt's Salaries | |

Fig. 170.—Continued.

| COAL EXPENSES | COAL EXPENSES | COAL EXPENSES |
|---|--|--|
| Mine Foreman Mine Clerks | Repairs to Tracks Electric Light Entry Driving Rooms and Rolls Ventilation Drainage & Watering Mine Timber and Props Dead Work Repairing Bldgs. and Chutes Repairs Machinery Superintendents and Clerks Engineering General Expense Incidentals | CAPITAL CHARGES Tramways, Chutes & Trestles Cars and Tracks Power and Machinery Buildings Coke Ovens Lands |
| 16 ENGINEERING Mine Surveyors and Assistants Office Supplies Outside Expenses | | |
| 17 GENERAL EXPENSES Janitor Service Sundry Supplies Office Fixtures Firing Office Heater | | |
| 18 INCIDENTALS Miscellaneous Teaming Pay Day Expenses Free Coal Watchman Guard and Special Service Ex. Rescue Apparatus | Total Expenses Mine No. Total Expenses Mine No. Total Coke Expenses Material and Supplies Rents Coal Sales Boarding and B. House Exp. Individuals and Co.'s Saw Mill Account Medical Dept. Water Supply Account Depreciation of Animals | CHARGES TO OTHER MINES |
| RECAPITULATION Expense of Mining Hauling Loading Repairs to Cars | | Total Amount of Roll Correct: |

Mine Superintendent.

Fig. 170.—Continued.

UTAH FUEL FUEL COMPANY

DISTRIBUTION OF PAY ROLLS AT COKE OVENS, FOR MONTH OF 19—

| 40 COAL USED Tons | 45 LADING COKE Loading R. R. Cars by Contract Loading R. R. Cars by Day Labor Car Hauling Shunting R. R. Tracks Drumming R. R. Cars and Tracks Repairs to R. R. Cars and Tracks Repairs and Repair Tools Working R. R. Cars | 46 REPAIRS TO BUILDINGS Sick Bins Store and Tool House Scale House Trestles and Bridges Superintendent's Office |
|--|---|--|
| 41 SUPERINTENDENTS & CLERKS Prop. Gen. & Coke Supply Coke Oven Expenses Prop. Gen. Office Clerks Prop. Gen. Office Supplies Timekeeper | 46 LOADING CHARGES Loading and Unloading R. R. Cars Hauling Away in Wagon Cleaning Decks Expense and Repair Tools Provision Stable Expense | 46 COKE EXPERIMENTS Examining and Coking Coal Transportation on Samples Cost of Analysis Repair Laboratory Equipment |
| 42 ENGINEERING Mine Surveyor and Assistants Office Supplies Outside Expenses | 47 FIRING COLD OVENS Wood Used Coal Used Charging, Burning and Drawing Disposing of Clinders | 47 INCIDENTALS Pay Day Expenses Watchman Janitor Service Telephone Service & Repairs |
| 43 CHARGING OVENS Preparation Power House Expense Handling Coal at Bins Cleaning at Bins and Spaces Weighing Charges Running Lorry Cars Repairing Lorry Cars and Tracks Repairing Motor and Power Lines Repairing Scales Lavatories | 48 REPAIRS TO COKE OVENS Brick and Fire Clay Stone, Lime, etc. Cast Iron, Loose Brasses Ranachlar Ovens Repair Dock Walls | RECAPITULATION Superintendents and Clerks Engineering Charging Ovens Burning and Drawing Loading Coke Working Cold Ovens Repairs to Cold Ovens Repairs to Buildings Coke Experiments Incidentals |
| 44 BURNING AND DRAWING Coke Puffers Flashing Oven Doors Preparation Power House Expense Preparation Pumping Expense Repairs Oven Water Line Repairs Tools Charging Hot Covers | | TOTAL COKE EXPENSE |

Fig. 171.—Form 25.

Pay-roll Distribution.—A distribution of the Pay-roll accounts is made up of forms 24 (Fig. 170) and 25 (Fig. 171) from the Office Time Books. The different amounts chargeable against each account or sub-division are segregated and entered as a total on this sheet, as a charge against the account or sub-division affected. The total amount of the distribution as shown on the report must agree with the gross earnings as shown by the Time Books and Pay-roll.

Separate statements are required for the mine and coke ovens.

These statements are journalized, the total as a credit to Pay-roll account and the distribution as debits to sundry accounts. These statements are made out in duplicate, copy being forwarded to the Auditor.

Supplies Purchased.—All material and Supplies are purchased by the Purchasing Agent located at the General Office. All purchase orders are issued in triplicate. The original copy goes to the vendor, the duplicate copy to the office files and the triplicate to the mine office, for which the supplies are purchased.

Material is purchased only on receipt of requisition from the mine properly signed. These requisitions are made out in duplicate, the origi-

[illegible]

FIG. 172.—FORM 26.

nal copy going to the Purchasing Agent and the duplicate remains on file at the mine office.

Supplies-stock Records.—In order to keep an accurate record of all material purchased and used, a loose leaf ledger, form 26 (Fig. 172), is used. A separate page is assigned each item or kind of material received. Entries are made to this record from invoices covering material purchased. Each item is entered as to quantity, and invoice cost also its proper proportion of the freight charges on the shipment, to cover the expenses of handling supplies at the mine, an amount is added to each item. The sum of all these items gives the cost at the mine, from which the cost per item is derived for use in charging out.

Material and Supplies used are posted as credits to the stock ledger from the Report of Material Used, form 28 (Fig. 174).

All Coal used in the boilers and for heating purposes at the mine, is

charged to the Material and Supply account by journal entry, crediting Earnings. From the Supply account it is charged out the same as any other material.

Supplies Used.—Supplies are issued by the Supply Clerk only on presentation of a Supply Order (form 27, Fig. 173) properly signed.

10-4-11-50 Bks-R. P. Co. Form 374 No. _____

UTAH FUEL CO.

_____ Utah, _____ 191 _____

M. & S. CLERK:

Please deliver to _____

the following material:

| Price | Amount | For What Purpose Used |
|-------|--------|-----------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

How paid: _____ Clerk

No material will be given out without an order from the office.

FIG. 173.—FORM 27.

These orders are in duplicate, the second copy being retained by the party issuing the same. The items on these orders are priced from the stock record, and the amounts extended, at the same time they are entered on the stock records as credits to the stock accounts affected.

[illegible]

FIG. 174.—FORM 28.

Supply Orders after being entered in the stock records are posted to the Material and Supplies Used Records (form 28, Fig. 174), being

charged to their proper account or sub-division as the case may be. The charges as shown by this record are summarized and journalized at the end of the month.

From this detailed Record of Supplies Used there is made up each month and forwarded to the Auditor a Report of Materials and Supplies Used, form 29 (Fig. 175).

[illegible]

FIG. 175.—FORM 29.

| <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p style="margin: 0;">UTAH FUEL COMPANY</p> <p style="margin: 0;">Statement of Local Coal Sales at _____ Mine _____ 191____</p> </div> <div style="text-align: center;"> <p>DR. CR.</p> </div> </div> | | | | | | | | | | |
|---|---------|---------|------|--------|--|--|--|--------|------|--------|
| SOLD TO | | | | WEIGHT | | TO WHOM SOLD AND HOW COLLECTED | | WEIGHT | RATE | AMOUNT |
| On hand from previous month | | | | | | <p>Employees Pay-Roll Deductions</p> <p>Cash Sales-B/ C vs Mine Sup't.</p> <p>Other Sales-B/ C vs</p> | | | | |
| Cars set for Local Sales and free Coal as per Weight Tickets | | | | | | | | | | |
| DATE | CAR NO. | INITIAL | KING | | | | | | | |
| | | | | | | <p>FREE COAL:</p> <p>Employees etc, per detail on back of Output Report</p> <p>Boarding House</p> <p>Store & Office Bldg.</p> <p>Various Mine Bldgs.</p> <p>Hospital</p> | | | | |
| | | | | | | <p>Loss in Weights</p> <p>On hand last day of month</p> | | | | |
| Total | | | | | | Totals | | | | |

This report must cover ALL mines and Free Coal at mines each month and agree with collections on Pay Rolls, Cash and Bills Collectable also report of Coal Sales kept at Mine and output report. Coal on hand last day of month, as shown, must be shown as, "On Hand" on Output Report.

Correct: _____

Mine Supr. _____

FIG. 176.—FORM 30.

A detailed statement of the local Coal sales is made up monthly and sent to the Auditor (form 30, Fig. 176).

All fuel shipped to the Coke ovens for making Coke is charged out through the supply account, and at the end of the month the total amount so charged is journalized, debiting Supply account and crediting Earnings.

Invoices.—All invoices come to the Purchasing Agent, who checks

prices and terms. The original and duplicate copies are forwarded to the mine receiving the material in question. The Material Clerk checks against the material received and also the purchasing order and if correct he O. K.'s. Each invoice is then entered in the stock ledger, giving all information called for. The original invoice is then forwarded to the Purchasing Agent, by him turned over to the Auditor for Vouchering, it then goes to the Treasurer for payment.

A record of all orders placed is kept by the Purchasing Agent, showing the Requisition and Order number and date, who ordered from and information regarding the receipt and forwarding of the invoices. See form 31 (Fig. 177).

[illegible]

FIG. 177.—FORM 31.

Bills Collectable.—These bills are really accounts receivable of a sundry nature. They are made out to cover rent due from tenants not in the employ of the company, providing it has not been paid in cash when due, also for material, fuel or labor furnished to individuals.

Boarding House—Record of Meals Served.—This record is kept on form 32 (Fig. 178) by the boarding-house manager. All meals furnished whether free, chargeable or cash, are accounted for. The manager fills in the name of each person he boards, his check number, if an employee of the company, and the number of meals served to him each day; the balance of the information called for is filled in by the Mine Clerk.

Board is furnished to employees of the company only on presentation of an order from the mine office properly signed, stating that the bearer, Name, check No. . . is entitled to room and board until further notice; on the issue of the order employee is charged with

Rent Record.—A record is kept on form 34 (Fig. 180), of the rent account with each dwelling house of the company, showing the lessee, check number, rental value, how collected and remarks. Entries are made on these records when houses are assigned to employees and again when they are vacated. The monthly rent is posted from and to the Pay-roll or Cash Book as the case may be.

Statement of Rent Account.—A Statement of the Rent Account is made out monthly on form 35 (Fig. 181), by the Mine Clerk and forwarded to the Auditor with the Pay-roll. This statement covers the amount of rent collected, how collected, house number and lessee. All dwellings are listed on this statement in numerical order and if vacant a notation is made in the remarks column.

Form 470, 12-5-10 1m-R. P. **FUEL COMPANY**

Statement of Rent Account at Mine, Month of 191

| House No. | Occupied by | Rent this Month | How Collected | | | Remarks |
|-----------|-------------|-----------------|---------------|------|-------------------|---------|
| | | | Pay-roll | Cash | Bills Collectable | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

RENT ROLL

..... Mine
..... 191

INSTRUCTIONS

Show every house number in consecutive order each month, whether occupied or vacant, and if vacant so report it.

This statement should show all rents and agree with collections on Pay-rolls, Cash and Bills Collectable and record kept at the mines.

Bills Collectable must be made and forwarded to this office through regular channel for all rents due and not paid through Pay-roll deduction or Cash.

When rent is less than a full month give number of days and explanation under head of "Remarks."

Rents refunded by vouchers account over collections should be shown in red, giving name of lessee, etc.

Send statement to Auditor, with distribution of Pay-rolls, each month.

| | | | | | | |
|--|--|--|--|--|--|--|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

See other Side for Instructions CORRECT:

Mine Supt.

FIG. 181.—FORM 35.

Animal Report.—A monthly statement covering all animals at the mine is made out on form 36 (Fig. 182) and forwarded to the General Manager, showing Name, Condition, working or idle, etc., on the reverse side of this statement is a recapitulation showing, animals at work, on the range, killed or sold, etc.

Form 554-2m—7-9-10 **FUEL COMPANY**

ANIMAL REPORT

Report of Horses and Mules at Mine For 191

| No. | Name | Kind | Ht. | Age | Wt. | Condition | Work or Idle | Killed or Injured | Name of Man in Charge | Sold or Transferred | |
|-----|------|------|-----|-----|-----|-----------|--------------|-------------------|-----------------------|---------------------|------|
| | | | | | | | | | | To | Amt. |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

RECAPITULATION

| | | | | | |
|--------------------------------------|--|--|--|--|--|
| Animals at mines first of month | | | | | |
| Animals on range first of month | | | | | |
| Animals purchased during month | | | | | |
| Animals killed and Sold during month | | | | | |
| Animals transferred during month | | | | | |
| Animals at mines last of month | | | | | |
| Animals on range last of month | | | | | |
| Total on hand | | | | | |

| | |
|--|--|
| No. of Animals injured during month | |
| No. of Animals died during month acct. sickness | |
| No. of Animals died during month acct. injury | |
| Average No. of Animals working during month | |
| Average No. of Animals idle at barn during month | |
| Average No. of Animals on range during month | |
| Total No. last of month | |

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

NOTE: Give cause of Death or injury to each Animal

REMARKS

Correct Mine Supt. Approved Veterinarian

FIG. 182.—FORM 36.

Animals—Killed and Sold.—A monthly report of Animals killed and sold is made out in duplicate by the mine clerk on form 37 (Fig. 183).

The original copy goes to the Auditor. Animals purchased are shown on the debit side and animals killed or sold shown on the credit side. This report is a detailed statement of the Animals Killed and Sold Account in the ledger.

REPORT OF ANIMALS KILLED AND SOLD at..... Mine.....

| | | | |
|-------------------------|--|-------------------------|--|
| Balance from last month | | Balance from last month | |
| | | | |
| | | | |
| | | | |
| Balance | | Charge Hauling | |
| | | | |

| | | | | |
|------------------------------------|--|--|--|--|
| Animals at mine first of month | | | | |
| Animals on range first of month | | | | |
| Animals purchased during the month | | | | |
| Animals Killed & Sold during month | | | | |
| Animals at mines last of month | | | | |
| Animals on range last of month | | | | |
| Total on hand | | | | |

To.....

Correct.....

FIG. 183.—FORM 37.

Forage Report.—A monthly report (form 38, Fig. 184) is made out showing the receipts and consumption of Hay and Grain during the month, Medicines, Barn labor, etc. The original copy goes to the General Manager and the duplicate to the Auditor.

Nationality Report.—At the end of each month a Nationality report is made out in triplicate covering the force employed. The information for this report is taken from the pay-rolls where the nationality of each man is noted. Original copy goes to the Auditor, duplicate to the General Manager and triplicate to the Superintendent. See form 39 (Fig. 185).

Daily Report of Mine Operations.—At the end of each day's run a daily report of operations is made out in triplicate (form 40, Fig. 186). The original copy going to the Auditor and the Duplicate to the General Manager.

This report covers the Force employed, Animals working, Shots fired and missed, Cars dumped, Trips run, Amount of Coal mined, shipped and on hand according to grades, also the time the mine worked, delays and the cause.

Daily Report of Coke Oven Operations.—A daily report covering the operation of the Coke Ovens is made out in triplicate (form 41, Fig. 187). The original copy goes to the Auditor, the triplicate to the General Manager.

| UTAH FUEL COMPANY | | | | | | |
|--|-------|------|---------|---------------|---------|-------------------------------|
| Report of Barn Supplies and Service At | | | | Mine..... 191 | | |
| POUNDS GRAIN | | | | POUNDS HAY | | |
| BRAN | CORN | OATS | ALFALFA | WILD | TIMOTHY | |
| On Hand First of Month | | | | | | Aver. No. Animals Fed Per Day |
| Received During " | | | | | | " " " Working in Mine |
| TOTAL | | | | | | " " " Outside |
| Fed During Month | | | | | | " " " Not Working |
| Sold " " | | | | | | |
| TOTAL | | | | | | No. Animals Killed |
| | | | | | | " " Injured |
| On Hand Last of Month | | | | | | " " In Barn |
| Fed Per Animal Per Day | | | | | | " " In Pasture |
| Total Amount Expended for Labor \$ | | | | | | |
| " " " " Medicine \$ | | | | | | |
| Cost Per Animal Per Day: | Grain | Hay | Labor | Medicine | Total | |
| Medicine on Hand Last of Month | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Correct | | | | Approved | | |
| Mine Supt. | | | | Veterinarian | | |

FIG. 184.—FORM 38.

| UTAH FUEL COMPANY | | | | | | | |
|--|----------------|-----------------|-----------------|---|---------------|--------------------------|--------|
| Report of Men Employed at ----- Mine ----- | | | | | | | 191 -- |
| NATIONALITIES | Miners in Mine | Day Men in Mine | Day Men Outside | Supt. Mine Foreman, Clerk, Ovr. Janitor | Coke Oven Men | Men on Construction Work | TOTAL |
| American | | | | | | | |
| German | | | | | | | |
| Finn | | | | | | | |
| Swede | | | | | | | |
| Austrian | | | | | | | |
| Slavs | | | | | | | |
| French | | | | | | | |
| Italian | | | | | | | |
| Greek | | | | | | | |
| Negroes | | | | | | | |
| Mexican | | | | | | | |
| Japanese | | | | | | | |
| Chinese | | | | | | | |
| TOTALS | | | | | | | |

Original to
Duplicate to
Triplicate to

Auditor
Gen'l Mgr.
Gen'l Supt.

Mine Supt.

FIG. 185.—FORM 39.

Form 9-10M-2-7-11-R. P. Co. **UTAH FUEL COMPANY**

Daily Report of Mine Operations Mine No. 191

| Men Employed | Inside | Out-side | Total | Miscellaneous | No. |
|------------------------|--------|----------|-------|-------------------------|-----|
| Miners | | | | Animals in Mine | |
| Drivers | | | | " Outside | |
| Trappers and Couplers | | | | " Not Working | |
| Hoist and Ropemen | | | | " On Construction Work | |
| Other Day-men | | | | Shots Fired | |
| | | | | Shots Missed | |
| Machinists and Helpers | | | | Mine Cars Dumped (Coal) | |
| Pumpmen | | | | " (Rock) | |
| Engineers and Firemen | | | | | |
| Crushermen | | | | Trips Made by Hoist | |
| Pumpers and Pushers | | | | " " | |
| Couplers | | | | " " | |
| Coal Loaders | | | | " " | |
| Other Day-men | | | | " " | |
| | | | | " " | |
| Construction Work | | | | " " | |
| Boarding House | | | | | |
| Supt., Mine Foreman | | | | | |
| Clerks and Janitor | | | | | |
| TOTAL | | | | | |

COAL MINED, SHIPPED AND ON HAND NOT BILLED OUT

| Kind of Coal | Mined | | Tons | Shipped | | On Hand | |
|------------------------|-------|-----|------|---------|------|---------|------|
| | Coal | Box | | Cars | Tons | Cars | Tons |
| Commercial Lump | | | | | | | |
| Railway " | | | | | | | |
| Run of Mine | | | | | | | |
| Smelter | | | | | | | |
| Nut | | | | | | | |
| Slack | | | | | | | |
| Dust | | | | | | | |
| Dust Wasted | | | | | | | |
| | | | | | | | |
| Coal to Boilers (kind) | | | | | | | |
| Coal to Coke Ovens | | | | | | | |
| Local Scales (kind) | | | | | | | |
| Railway Engines (kind) | | | | | | | |
| Company Mine Buildings | | | | | | | |
| Rock and Waste | | | | | | | |
| TOTALS | | | | | | | |

| Mine Worked | Hours | Min | Account |
|-------------|-------|-----|---------|
| " Idle | " | " | |
| " " " " " | " | " | |
| " Delayed | " | " | |

FIG. 186.—FORM 40.

This report covers the Force employed and statistics regarding the operation of the ovens, the production and disposition of coke according to grades, etc.

Form 489-1-12-11-2M-R. P. Co. **UTAH FUEL COMPANY**

Daily Report of Coke Oven Operations. Sunnyside, 191

| | | First Class | Gas Coke | Screenings | Total |
|--------------------|----------------------|-------------|----------|------------|-------|
| Disposi- tion | Production | | | | |
| | Loaded in R. R. Cars | | | | |
| | Docked | | | | |
| | Total | | | | |
| | Brought Forward | | | | |
| | Total | | | | |
| Balance on Hand | Coke Billed | Cars | Cars | Cars | Cars |
| | Loads Unbilled | | | | |
| | Part Loads | | | | |
| | On Docks | | | | |
| | Total | | | | |

| | | Men Employed | |
|----------------------------------|--|------------------------|--|
| No. Ovens Pulled and Charged | | Superintendent | |
| No. Ovens Pulled Only | | Foremen | |
| No. Ovens Charged Only | | Clerks | |
| No. Ovens Idle Account Repairs | | Weightmen | |
| No. Ovens Lost Account Not Ready | | Bin Men | |
| No. Ovens Lost Account | | Larry Men | |
| No. Ovens Lost Account | | Cart Men | |
| No. Ovens Burning | | Car Droppers | |
| No. Ovens in Operation | | Blacksmith and Helpers | |
| No. Ovens Not in Operation | | Mason and Helpers | |
| Total Number of Ovens | | Track and Water Men | |
| | | Plastering Oven Doors | |
| | | Other Day Men | |
| | | Total Company Men | |
| | | Levelers | |
| | | Coke Pullers | |
| | | Coke Loaders | |
| | | Total Number Men | |

Slack Record

| | Cars | Tons |
|-----------------|------|------|
| Brought Forward | | |
| Slack Dumped | | |
| Total | | |
| Slack Charged | | |
| Balance in Bins | | |

Remarks: _____

Superintendent of Coke Ovens

FIG. 187.—FORM 41.

Monthly Report of Operations.—This report (form 42, Fig. 188) is made out in triplicate at the end of each month, the original copy going

Forms 226 2 M 3-15-11 R. P. Co.

UTAH FUEL COMPANY

Average Report of Operations.....Mine No.....Month of.....191.....

| Mine Operations | This Month | Average Tonnage | Last Year Same Month | Average Tonnage | Mine Operations | This Month | Same Month Last Year |
|---------------------------|------------|-----------------|----------------------|-----------------|----------------------------|------------|----------------------|
| No. days mine worked | | | | | Avg. No. trips made by | | |
| Total tons coal mined | | | | | Hoist | | |
| Total mined from pillars | | | | | | | |
| " " " entries and rooms | | | | | | | |
| Average No. men in mine | | | | | | | |
| Miners | | | | | | | |
| Day Men | | | | | | | |
| Drivers | | | | | | | |
| Hoist and rope men | | | | | | | |
| Trappers and couplers | | | | | No. cars loaded | | |
| Animals in mine | | | | | Coal | | |
| Average No. men outside | | | | | Box | | |
| Day men | | | | | Percent. coal cars | | |
| Coal loaders | | | | | " box cars | | |
| Dumpers and top men | | | | | Commercial lump | | |
| Couplers | | | | | Railway lump | | |
| Engineers and firemen | | | | | Run of Mine | | |
| Men hauling props | | | | | Nut | | |
| Powder used | | | | | Slack | | |
| Pounds Hercules | | | | | Dust | | |
| " black | | | | | Local Sales | | |
| No. shots fired | | | | | Coal to boilers | | |
| " " missed | | | | | Dust wasted at mines | | |
| No. mine cars dumped coal | | | | | Rock and waste | | |
| " " " " waste | | | | | Hours idle account of | | |
| No. hours delayed acct. | | | | | | | |
| COKE OVENS | | | | | COKE OVENS | | |
| Avg. No. Co. day men | | | | | No. days ovens worked | | |
| " " coke pullers | | | | | " tons coal charged | | |
| " " Levelers | | | | | " " coke made | | |
| " " Loaders | | | | | Avg. tons made per day | | |
| " " storing coke | | | | | Percentage of coke to coal | | |
| No. cars coke loaded | | | | | Avg. No. ovens charged | | |
| No. ovens delayed acct. | | | | | " " " drawn | | |
| | | | | | No. tons coke stored | | |

FIG. 188.—FORM 42.

to the Auditor, and the duplicate to the General Manager. The report covers statistics of Force employed at both mine and coke ovens, also tonnage for the month, previous year, etc.

Weighmasters Report.—All railroad cars loaded are weighed and recorded on a track sheet (form 43, Fig. 189) made in triplicate. The, original copy goes to the Auditor, the duplicate to the Chairman of the Local Freight Bureau, the triplicate copy remains on file. Regular Bill of Lading covering coal shipped is made out from this report.

Instructions for filling out the forms are printed at the bottom.

[illegible]

FIG. 189.—FORM 43.

Shipping Report.—A daily Shipping Report (form 44, Fig. 190) is made out in duplicate original copy to the Auditor and duplicate to the General Sales Agent, this report is made up from the Weighmasters reports. There is also added by the Auditor the earnings of the shipments shown.

| UTAH FUEL COMPANY | | | | | |
|--|--|----------------|-----------------------------|---------|---------------------------------|
| REPORT OF COAL MINED AND DISTRIBUTION | | | | | |
| Mine No. | | Month of | | 19..... | |
| MINED | | | Total Product Pounds | | Total to Acct for Pounds |
| Balance on hand from last month, | | | | | |
| Mined by Miners, Pay Roll, | | | | | |
| Mined by Company, Day Men, | | | | | |
| Mined Plus Percentages Deducted, | | | | | |
| Total, | | | | | |
| Less Loss in Weights, | | | | | |
| Plus Gain in Weights, | | | | | |
| Total, | | | | | |
| DISTRIBUTION | | | | | |
| Shipments, | | | Lump | | |
| " | | | Run of Mine | | |
| " | | | Nut | | |
| " | | | Slack or Screenings | | |
| " | | | Dust | | |
| D. & R.G. R.R. Engines at Mines (Per Coal Tickets) | | | Lump | | |
| " " " " " " | | | Run of Mine | | |
| Sold at Mines (Per Local Sales Report) | | | Lump | | |
| | | | | | |
| Free Coal (See reverse side for detail) | | | | | |
| | | | | | |
| Coal to Bollers, | | | | | |
| " " Boarding House | | | Lump | | |
| " " Store and Office Building. | | | " | | |
| " " Various Mine Buildings, | | | " | | |
| | | | | | |
| Coal to Coke Oven Bin, | | | Slack | | |
| | | | | | |
| Coal on Hand in R.R. Cars | | | Lump | | |
| " " " " | | | Run of Mine | | |
| " " " " | | | Nut | | |
| " " " " | | | Slack or Screenings | | |
| " " In Bin, | | | Slack | | |
| Total, | | | | | |
| COKE | | | POUNDS | | POUNDS |
| Coke on hand from previous month | | | | | |
| Coke Made | | | | | |
| Total to Ship | | | | | |
| Amount Shipped | | | | | |
| Balance on Hand | | | | | |
| Coke screenings shipped | | | | | |
| | | | | | |
| No. Days Mine Worked | | | Correct: | | Mine Supt. |

| STATEMENT OF FREE COAL FURNISHED | | | | | (Reverse Side) |
|---|------------|------|--------|---------|----------------|
| NAME | OCCUPATION | KIND | WEIGHT | REMARKS | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Total, | | | | | |

FIG. 194.—FORM 48.

Coal and Coke Mined and Shipped.—A daily record of the production and shipments of both coal and coke is kept on form 45 (Fig. 191). This record shows the production according to grade, also the shipments according to grade.

Record of Operations Mine.—This record is in book form. In it are recorded each day the production of Coal according to grades, the

| ESTIMATED COAL AND COKE TONNAGE AND EARNINGS | | | | | | | | | | | |
|--|--|------------|---------|------|---------|------|---------|------|---------|------|---------|
| Date | | 1908, from | | | | Mine | | | | | |
| COAL | | TONS | EARN'GS | TONS | EARN'GS | TONS | EARN'GS | TONS | EARN'GS | TONS | EARN'GS |
| COMMONWEALTH | | | | | | | | | | | |
| Utah points via R.G.W.R. | | | | | | | | | | | |
| " " " O.S.L.R.R. | | | | | | | | | | | |
| Colo. points via D. & R.G.R.R. | | | | | | | | | | | |
| " " " C.M.R.R. | | | | | | | | | | | |
| Idaho " " O.S.L.R.R. | | | | | | | | | | | |
| Montana " " " | | | | | | | | | | | |
| Washington " " | | | | | | | | | | | |
| Oregon " " " | | | | | | | | | | | |
| Nevada " " So. Pac. | | | | | | | | | | | |
| California " " " | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |
| TO RAILROADS | | | | | | | | | | | |
| R.G.W.R. | | | | | | | | | | | |
| D. & R.G.R.R. | | | | | | | | | | | |
| C.M.R.R. | | | | | | | | | | | |
| O.S.L.R.R. | | | | | | | | | | | |
| So. Pac. Co. | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |
| Coal to Coke Ovens | | | | | | | | | | | |
| " " " " S.S. | | | | | | | | | | | |
| " " " " C.C. | | | | | | | | | | | |
| " " " " W.Q. | | | | | | | | | | | |
| " " " " C.G. | | | | | | | | | | | |
| " " " " S.S. | | | | | | | | | | | |
| " " " " Somerset | | | | | | | | | | | |
| Coal Sold at Mines | | | | | | | | | | | |
| Coal Unconsigned | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |
| TOTAL COAL | | | | | | | | | | | |
| COKE | | | | | | | | | | | |
| Utah Smelters | | | | | | | | | | | |
| " " Other Industries | | | | | | | | | | | |
| Idaho | | | | | | | | | | | |
| Montana | | | | | | | | | | | |
| Nevada | | | | | | | | | | | |
| California | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |
| TOTAL COAL AND COKE | | | | | | | | | | | |
| REMARKS: | | | | | | | | | | | |

FIG. 195.—FORM 49.

Force employed, and misc. information regarding Animals, Shots Fired, etc. The information for this record comes from the Daily Report of Operations. See form 46 (Fig. 192).

Record of Operations Coke.—This record is in book form. In it are recorded each day from the Daily Report of Coke Oven Operations, the

[illegible]

number of Ovens Pulled, charged and delayed, the Coke loaded and the Force employed. See form 47 (Fig. 193).

Report of Coal Mined and Distribution.—At the end of each month a report is made out (form 48, Fig. 194) covering the production and distribution for the month. A copy of this report is sent to the Auditor.

Estimated Tonnage and Earnings.—This is a daily report made out by the mine clerk on form 49 (Fig. 195), and sent to the Auditor. This report shows the shipments classified as to grade also as to States consigned to and Railroad lines. Against the grade classifications are shown the tonnage and estimated earnings therefrom for each shipping classification.

Cash Book.—The cash book is kept in duplicate thus doing away with the extra work necessary in rewriting for report to the Auditor. The duplicate page is torn from the book at the end of each month and forwarded to the Auditor. The cash book is ruled four columns on the receipt side, these columns are headed, Sundries, Material and Supplies, Local Coal Sales. On the disbursement side, the one column that is used is headed Remitted to Treasurer.

Journal.—This book is the standard journal and used as such.

Journal of Corrections—Coal Sales.—This book is used for making correction in the weight or price of Coal or Coke shipped. In making entries in this book debits are shown in black ink and credits in red. At the end of the month the differences in the weight and earnings are journalized in the usual manner. See form 50 (Fig. 196).

Ledger.—Ledgers are not used at the mines, all accounts are kept at the General Office.

WASATCH STORE COMPANY

This company operates stores, doing a general mercantile business, at the various mines of the fuel company.

The following accounts are carried on the general ledger:

- | | |
|-----------------------|-----------------------------------|
| 1. Treasurer | 10. Pay-roll |
| 2. Buildings | 11. Coupons, books and Stationery |
| 3. Store Fixtures | 12. Coupons Outstanding |
| 4. Teams and Wagons | 13. Taxes |
| 5. Merchandise Bought | 14. Insurance |
| 6. Merchandise Sold | 15. Depreciation account |
| 7. Expense | 16. Individuals and Companies |
| 8. Earnings | 17. Profit and Loss |
| 9. Vouchers | |

1. Treasurer.—This account is handled by the Auditor the same as Cash. When Vouchers are paid the Treasurer is credited and Vouchers charged.

2. Buildings.—This account covers the cost of all buildings owned by the store company.

3. Store Fixtures.—This account covers the cost of all store fixtures and furniture of the company.

4. Teams and Wagons.—This account covers the cost of all Teams, Wagons and Harness of the company.

5. Merchandise Bought.—All merchandise purchased for the various stores of the company is charged to this account through the Abstract of Vouchers.

6. Merchandise Sales.—All sales at the stores are credited to this account. Charge sales being charged to Individuals and Companies; Coupon sales being charged to Coupons Outstanding and cash sales are charged to Treasurer, this account being handled exactly the same as the cash account. In closing the books, this account is closed into the Merchandise Bought account, in order to arrive at the actual gross earnings. The balance at the credit of this account (Merchandise sales) represents the sales at cost.

Sales Report.—A weekly report is made out in triplicate on form 51 (Fig. 197), at each store. The disposition of these reports is explained on the forms. This report covers the sales, receipts, and remittances in detail.

7. Expense Account.—This account gives all salaries of store employees and all other expenses incurred for the operating or maintaining the stores of the company including depreciation charges.

8. **Earnings.**—The monthly gross earnings of the different stores of the company are estimated separately, based on the per cent. of gross earnings to sales for the previous six months, and entry is made charging Sales and crediting Earnings. Inventories are taken every six months and any adjustment necessary is made at that time.

9. **Vouchers.**—This account is credited with all Vouchers passed to the Treasurer for payment, as per the total of the Abstract of Vouchers

Form 200

WASATCH STORE COMPANY

MANAGER'S REPORT OF SALES, RECEIPTS AND REMITTANCES

Of _____ Store for week ended _____ 191

| SALES | | | |
|--|-------------------|--|--|
| Coupon Sales | | | |
| Ind. and Co.'s Sales | | | |
| Cash Sales, per Registers | | | |
| TOTAL | | | |
| RECEIPTS | | | |
| Cash on Hand | | | |
| From Coupon Sales | | | |
| " Ind. and Co.'s "Coupons" | | | |
| " " "Cash" | | | |
| " Cash Sales, per Registers | | | |
| Over or Short | | | |
| TOTAL | | | |
| REMITTANCES | | | |
| Acc't Coupon Sales Sent to Auditor | | | |
| " Ind. and Co.'s "Coupons" Sent to Auditor | | | |
| " " "Cash" Sent to Treasurer | | | |
| " Cash Sales " " | | | |
| Balance on Hand at Store | | | |
| TOTAL | | | |
| Original to Auditor with Coupon Remittance Duplicate to Treasurer with Cash Remittance Triplicate to Manager | Detail of Balance | | |
| Correct: | Gold | | |
| | Silver | | |
| | Currency | | |
| | TOTAL | | |

Store Manager
_____ 191

Compare above figures with exhibit and see that they agree. Store managers will retain impression copy of this report.

FIG. 197.—FORM 51.

when the Vouchers are paid this account is charged and the Treasurer is credited.

10. Pay-roll.—The store Pay-rolls are made up in the same manner as the mine Pay-rolls and are forwarded to the Treasurer for payment. Payment is made by checks and the Pay-roll account charged, the Treasurer being credited. The Pay-roll distribution is charged to expense account.

11. Coupons, Books and Stationery.—This account is charged with all coupon books purchased by the company, also with all store stationery bought. As coupons are issued they are charged to Individuals and

WASATCH STORE COMPANY

Mine _____ 191

From 211. C.P. Co. 5-23-11-1000

To the Auditor: _____ Below please find Coupon Stock Report for Month of _____ 191

| Denominations— | \$1.00 | | \$2.00 | | \$3.00 | | \$5.00 | | \$10.00 | | \$20.00 | | Amounts | |
|---------------------------------|--------|-------|--------|-------|--------|-------|--------|-------|---------|-------|---------|-------|---------|------|
| | Nos. | Books | Nos. | Books | Nos. | Books | Nos. | Books | Nos. | Books | Nos. | Books | Dollars | cts. |
| Balance from previous month | | | | | | | | | | | | | | |
| Received | | | | | | | | | | | | | | |
| Commencing No. Closing No. | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | |
| Sold | | | | | | | | | | | | | | |
| Commencing No. Closing No. | | | | | | | | | | | | | | |
| Balance on hand | | | | | | | | | | | | | | |
| Commencing No. Last No. on Hand | | | | | | | | | | | | | | |
| Totals | | | | | | | | | | | | | | |

Remarks: _____

This report to be made at the close of each month and sent to the Auditor. Duplicate to the Manager at Salt Lake City.

Correct,
_____ 191

FIG. 198.—FORM 52.

Companies A/C and credited to this account. The mining company collects through the Pay-roll for coupon books issued by the store company, and at the end of the month when these collections are forwarded to the store Treasurer, he reports the same to the Auditor, who makes a journal entry charging Treasurer and crediting Individuals and Companies A/C. Stationery is charged out to Expense account as used.

Coupon Report.—At the end of each month a Coupon Report is made out in triplicate on form 52 (Fig. 198) at each store. The disposition of these reports is stated on the forms. This report shows the coupons on hand the first of the month, amount received during the month, amount sold during the month, and balance on hand at the close of the month.

12. Coupons Outstanding.—The company issues coupons in book form to facilitate trading at the company's stores. When coupon books are issued to employees, an entry is made in a Coupon Register for this purpose, listing the name, Check number, House number, Coupon numbers and the value of the same. Employee's receipt for the coupons they receive opposite the entry in the register. All the amounts due the company for coupons issued are collected on the mine Pay-rolls. Coupons redeemed by the store company are remitted to the Auditor weekly.

On the general books in the Auditor's office, an entry is made each month charging Individuals and Companies, Coupon account, and Crediting Coupons Outstanding, with the total amount of Coupons issued during the month. An entry is also made charging Coupons Outstanding and crediting Merchandise Sales with the total amount of coupons taken in by the store, and remitted during the month to the Auditor.

13. Taxes.—The store company taxes are handled in the same way as those of the mining company, being pro-rated out one-twelfth each month to expense account.

14. Insurance.—The insurance account is handled in the same manner as the mining company handles theirs, being pro-rated out to Expense account one-twelfth each month.

15. Depreciation.—This account is credited with the various amounts charged off each month to Expense account, for the Depreciation of the Store buildings, Fixtures and Furniture, and Teams and Wagons. The rate of Depreciation is figured at 10 per cent. a year and the amount is pro-rated to Expense account one-twelfth each month.

16. Individuals and Companies.—This account represents the total Charged sales and is credited with total amounts paid on account each month.

17. Profit and Loss.—All operating and Income accounts are closed into this account at the end of each year.

A monthly Financial Statement is made up by the Auditor covering the operations of the company, of which the following is a copy.

WASATCH STORE COMPANY

Exhibit.....19.....

INCOME ACCOUNT

| | |
|-------------------------------------|--|
| For the month of | |
| Gross earnings | |
| Expenses | |
| Total net earnings from store | |
| ADD— Vouchers, Discounts, etc. | |
| TOTAL INCOME | |
| DEDUCT—Taxes | |
| Insurance | |
| Depreciation | |
| TOTAL NET INCOME | |

INCOME ACCOUNT

| | |
|--|--|
| Fiscal year to date | |
| Gross earnings | |
| Expenses | |
| Total net earnings from stores | |
| ADD, Vouchers, Discounts, etc. | |
| TOTAL INCOME | |
| DEDUCT—Taxes | |
| Insurance | |
| Depreciation | |
| ADD, Actual earnings in excess of estimated earnings for six months ended.....as disclosed by inventory..... | |
| LESS, Dividend No.....declared and paid in..... | |
| NET INCOME | |

PROFIT AND LOSS ACCOUNT

| | |
|---|--|
| By balance at credit of Profit and Loss account | |
| Income as above | |
| To dividend No..... | |
| Balance | |
| By balance to credit of Profit and Loss account | |

BALANCE SHEET

| | |
|--|--|
| Current Asset. | |
| Fire Insurance (not charged out) | |
| Coupon books and Stationery | |
| Due from Indvs. and Companies | |
| Coupons sold mine employees | |
| Due from Bills Collectable | |
| Due from Utah Fuel Co. | |
| Cash on hand at stores | |
| Cash in hands of Treasurer | |

CURRENT LIABILITIES

| | | |
|---------------------|-------|-------|
| Vouchers | ..... |  |
| Pay-rolls | ..... |  |
| Coupons Outstanding | ..... |  |
| General Accounts | | |
| Merchandise | ..... |  |
| Store Fixtures | ..... |  |
| Teams and Wagons | ..... |  |
| Buildings | ..... |  |
| Less depreciation | ..... |  |
| Capital Stock |  | ..... |
| Deferred Accounts | | |
| Unpaid Taxes | ..... |  |
| Profit and Loss | ..... |  |

CHAPTER V

MINING AND MILLING GOLD ORE

ACCOUNTING METHODS OF THE PORTLAND GOLD MINING COMPANY

In the Cripple Creek District of Colorado, the Gold bearing ores, which are tellurides, occur in a system of veins and irregular replacement ore bodies. The veins have an almost vertical dip and are generally narrow.

The development of these Gold deposits is by vertical shafts, levels being run from the shafts at regular distances. The vein rock is broken down in the stopes with Air Drills, it is then loaded into tram cars, and trammed to the shaft, where the cars are run onto a cage and hoisted to surface. At surface the cars go directly into the Ore Houses and are dumped, all the ore is screened, the coarse ore being washed and hand sorted before shipment. First class ore is shipped direct to the smelter, the other ore is sold to the company's mills the same as if it was going to a custom mill, a regular treatment charge being made.

Ore when received at the mill goes first to the crushers and then to the concentrating tables. From the tables the concentrates go to the Barrel House and are diverted into tube mills and slimed with a cyanide solution, the pulp passes to several filter presses for filtering. The rich gold solution from these presses is precipitated on zinc dust.

The resulting precipitates and concentrates are reduced to bullion.

The Portland Gold Mining Company operates two mills, one at the mine and one at Colorado Springs, Colo. In their method of accounting, each mill and the mine are independent.

Books of account are not kept at either mine or mills except a "Petty Cash" Book, but bookkeeping is done at the Head Office.

The accounts for the Victor Mill only are shown.

THE COST OF GOLD AT THE MINT

[illegible]

NOTE.—Debit accounts are underlined, items appearing below them may be either sub-accounts or direct charges.

HEAD OFFICE—LEDGER ACCOUNTS

| General accounts | Sub-accounts |
|--------------------------|--|
| Capital Stock | |
| Securities | |
| Property | |
| Cash | |
| Vouchers Payable | |
| Accounts Receivable | |
| Permanent Equipment..... | <ul style="list-style-type: none"> (Buildings Machinery Headworks Cars and Rails Pipe Lines Tools and Appliances Stable Account Office Appliances |
| Loss and Gain | |
| Dividends | |
| Mining Expense..... | <ul style="list-style-type: none"> (Breaking Ore Tramming Timbering Hoisting Sorting and Loading Pumping Lighting Assaying and Sampling Surveying Repairs General Expense |
| Furniture and Fixtures | |
| Drainage Tunnel | |
| Victor Mill..... | <ul style="list-style-type: none"> (Coarse Crushing Conveying and Sampling Fine Crushing Concentrating Classifying Tube Milling De-watering Agitating Precipitating Melting Filtering Solution Tailings Expense Assaying Expense Bullion Expense Concentrates |

HEAD OFFICE—LEDGER ACCOUNTS

| General accounts | Sub-accounts |
|----------------------|---------------------|
| Portland Mill | |
| Gold Account | |
| Pay-roll | |
| Supplies | |
| Litigation | |
| Unclaimed Wages | |
| Unclaimed Dividends | |
| | Officers' Salaries |
| | Insurance |
| | Taxes |
| General Expense..... | Legal Expense |
| | Miscellaneous |
| | Office Expense... { |
| | Salaries |
| | Rents |
| | Stationery and |
| | Printing |
| | General Expense |

Capital Stock.—To this account is credited the amount of the Capital Stock of the company (par value). The debit for this journal entry might have been to "Subscription," "Treasury Stock" and (or) "Property," depending entirely upon the way the property was originally purchased and the disposition of the stock at the time the company was organized.

Securities.—This account is charged with all investments in the stocks or bonds of other corporations, and will be credited with the proceeds of the sale of such securities.

Property.—This account is charged with the original cost of the mining property, also the cost of additional lands purchased.

Cash.—This account is handled in the usual manner, showing the receipts, disbursements and balance on hand each month.

Vouchers Payable.—This account is credited with the footing of the Voucher Register for the month and is debited with all Vouchers paid during the month as per Cash Book.

Accounts Receivable.—This account shows the amount due the company in the aggregate. Separate accounts are kept with each individual or corporation with whom an account is opened.

Loss and Gain.—The following accounts are charged into this account each month by journal entry:

| | |
|----------------|-----------------|
| Mining Expense | General Expense |
| Victor Mill | Gold. |
| Portland Mill | |

When the surplus credits of this account are of such proportions as to warrant the Directors in declaring Dividends, the amount so declared is debited to this account and credited to the "Dividend" account.

Dividends.—This account is charged with all dividends declared by the company and paid to stockholders.

Permanent Equipment.—This account is charged with all Plant Account expense each month as per Superintendents' reports. The following sub-accounts are carried for the mine:

| | |
|----------------|----------------------|
| Buildings | Pipe Lines |
| Machinery | Tools and Appliances |
| Headwork | Stable Account |
| Cars and Rails | Office Appliances. |

Accounts are also carried for each mill.

Mining Expense.—This account is charged with Stoping and Development expense as shown by the Mine Agent's report each month. The following sub-accounts are carried:

| | |
|---------------------|-----------------------|
| Breaking Ore | Lighting |
| Tramming | Assaying and Sampling |
| Timbering | Surveying |
| Hoisting | Repairs |
| Sorting and Loading | General Expense. |
| Pumping | |

Furniture and Fixtures.—This account is charged with all office furniture including desks, tables, chairs, typewriters, adding machines, check perforators, etc.

Drainage Tunnel.—This account is charged with all payments made on account of the construction of the Deep Drainage Tunnel which will furnish permanent drainage for the mine below the present working levels.

Victor Mill.—This account is charged with all milling expenses each month as per reports of the Mill Superintendents. The following sub-accounts are carried:

| | |
|------------------------|-----------------------|
| Coarse Crushing | Precipitating |
| Conveying and Sampling | Melting |
| Fine Crushing | Filtering |
| Concentrating | Solution |
| Classifying | Tailings Expense |
| Tube Milling | Assaying Expense |
| De-watering | Bullion Expense |
| Agitating | Concentrates Expense. |

Portland Mill.—This account is handled the same as the above.

Gold Account.—This account is intended to cover the income received from the sale of all product of the mine and mills, and represents the earnings of the company from production.

Pay-roll.—This account is credited with the amount of the pay-rolls as forwarded from the mine and mills and charged to their accounts;

when the checks are drawn for these amounts the total sums are charged to this account from the Cash Book.

Supplies.—All supplies for the mines and mills are charged to this account through the Voucher Register, and credit is given this account for all supplies used by the mine and mills as per the monthly Cost Sheets.

Litigation.—The expenses of all litigation goes into this account, and an estimated monthly proportion is charged out each month to Legal Expense.

Unclaimed Wages.—This account is credited with all unclaimed wages of workmen which have not been called for during a period of six months.

Unclaimed Dividends.—This account is credited with all dividends remaining unclaimed for a period of six months.

General Expense.—This account comprises the following sub-accounts:

Officers' Salaries.—This account is intended to cover the salaries of corporation officers only.

Insurance.—This account is charged with a monthly proportion of the insurance premiums falling due in the year. The credit for this charge is to the "Insurance Suspense" account.

Taxes.—This account is charged with a monthly proportion of the Taxes for the year. The credit for this charge is to the "Taxes Suspense" account.

Legal Expense.—This account is charged with all Counsels' fees, Legal retainers, and all expenses incident to any litigation of the company.

Miscellaneous.—This account is intended to cover Directors' fees, traveling expenses, and all expenses not covered by the above accounts.

Office Expenses.—This account is intended to cover all expenses of the General Office itself, and is shown under the following sub-divisions.

Salaries.—To cover office help.

Rent.—To cover the rent of the General Office.

Stationery and Printing.—To cover all books, stationery, printed matter of all kinds and postage.

Miscellaneous.—To cover all General Office expenses not covered by the above, such as Telephone, light, general supplies, etc.

In the annual report to stockholders a Financial Statement is shown as follows:

SECRETARY AND TREASURER'S REPORT

Operation for 1911

| | |
|--------------------------------------|-------|
| Gross value of Ore mined and shipped | ..... |
| Gross values recovered by New Mill | ..... |
| Net cost of Mining and Milling | ..... |
| Gross profit on operations | ..... |

Operation Continued

| | |
|---|-------|
| Gross profit as above | ..... |
| Interest Discount and Exchange | ..... |
| Revenue from other sources | ..... |
| Net profit on operation of mine and mills | ..... |

Surplus or Profit and Loss Statement for 1911

| | |
|----------------------------------|-------|
| Balance January 1, 1911 | ..... |
| Net profit as above | ..... |
| Sundry losses on railroad claims | ..... |
| Dividends paid | ..... |
| Depreciation: | |
| Value in place of ore mined | ..... |
| Mine Property | ..... |
| Mill property | ..... |
| New mill property | ..... |
| Permanent Equipment | ..... |
| Office Furniture and Fixtures | ..... |
| Railroad Rolling stock | ..... |
| Drainage tunnel | ..... |
| Balance to 1912 account | ..... |

Cash Receipts and Disbursements for 1911

| | |
|---|-------|
| Balance January 1, 1911 | ..... |
| From operation of mine and mills | ..... |
| Bills Receivable | ..... |
| Sale of Junk and Revenue from all other sources | ..... |
| Vouchers and Pay checks | ..... |
| Dividends paid | ..... |
| Balance January 1, 1911 | ..... |

Balance Sheet, January 1, 1912

| | |
|--------------------------------------|-------|
| Cash on hand and in the bank | ..... |
| Ore on hand at the mill | ..... |
| Bills and Accounts Receivable | ..... |
| Store and Supplies at mine and mills | ..... |
| Property account: | |
| Mine | ..... |
| Mill | ..... |
| New Mill | ..... |
| Permanent Equipment | ..... |
| Railroad Rolling Stock | ..... |
| Securities | ..... |
| Furniture and Fixtures | ..... |
| Drainage Tunnel | ..... |
| Litigation and Engineering Suspense | ..... |
| Insurance Prepaid | ..... |

| | |
|-----------------------------|-------|
| Unclaimed Wages | ..... |
| Unclaimed Dividends | ..... |
| Unearned Treatment Charges | ..... |
| Capital Stock | ..... |
| Surplus, or Profit and Loss | ..... |

MINE ACCOUNTS—MINE BOOKS

| General Accounts | Sub-accounts | Distributed Accounts |
|---------------------|---|---|
| Stoping..... | <ul style="list-style-type: none"> Breaking Ore Tramming Timbering Hoisting Sorting and Loading Other Expense | <ul style="list-style-type: none"> Carpenter shop and Surface Blacksmith Shop Machine Shop Boiler Room Compressing Machine Drills Auxiliary Hoists |
| Development..... | <ul style="list-style-type: none"> Drifts Crosscuts Raises and Winzes Shaft No. 1 Shaft No. 2 Shaft No. 3 | <ul style="list-style-type: none"> Hoisting Electric Plant Waste Haulage Ore House Tramming Timbering Fuel |
| Milling..... | <ul style="list-style-type: none"> Portland Mill Freight Tramming to Victor Mill Buildings Machinery Headwork | <ul style="list-style-type: none"> Lumber and Timber Explosives Supplies Pumping Lighting Assaying and Sampling |
| Plant Account..... | <ul style="list-style-type: none"> Cars and Rails Pipe Lines Tools and Appliances Stable Account Office Fixtures | <ul style="list-style-type: none"> Surveying Repairs General Expense Office Expense Victor Mill Account |
| Cash | | |
| Vouchers Payable | | |
| Accounts Receivable | | |
| Pay-roll | | |
| Supplies..... | <ul style="list-style-type: none"> Storehouse Explosives Lumber and Timber Fuel | |
| Insurance | | |
| Hospital | | |

Stoping.—This account is made up of the following sub-accounts:

| | |
|--------------|---------------------|
| Breaking Ore | Hoisting |
| Tramming | Sorting and Loading |
| Timbering | Other Expense |

Distribution Sheets.—For each mine opening, both stopes and in development work, that is active during the month, one of these sheets is made out, Fig. 199 Form No. 6. The information called for on these sheets is taken from the "Machine Men's Reports" (form 2), the "Trammer's Reports" (form 13), and the "Shift Reports" (form 4). Additional information which is not furnished on the above reports is taken from the books.

The total amount of the Stoping account on the ledger for the month, is equaled by the sum of the totals taken from the Stope Distribution Sheets for the same period. In the same way the Development account is equaled by the sum of the totals from the Development Distribution Sheets.

Development.—This account is made up of the following sub-accounts:

| | |
|-------------------|--------------|
| Drifts | Shaft No. 1. |
| Crosscuts | Shaft No. 2 |
| Raises and Winzes | Shaft No. 3 |

Milling.—This account is made up of the following sub-accounts:

| |
|-------------------------|
| Portland Mill |
| Freight |
| Tramming to Victor Mill |

Plant Account.—This account is made up of the following sub-accounts:

| | |
|----------------|----------------------|
| Buildings | Pipe Lines |
| Machinery | Tools and Appliances |
| Headwork | Stable Account |
| Cars and Rails | Office Fixtures |

Cash.—Only a "Petty Cash" book is kept at the mine office.

Vouchers Payable.—This account is credited with the footing of the Voucher Register for the month and is charged with vouchers paid for the month as per the Cash book.

Pay-roll.—This account is credited with the gross earnings of labor for the month as shown by the Pay-roll and is charged with the Pay-roll account paid as shown by the Cash book each month.

Accounts Receivable.—This account comprises the total amount due the company as per the individual accounts on the ledger.

Insurance.—This account covers deductions made from the gross earnings of employees, on account of workmen's collective insurance.

[illegible]

FIG. 199.—FORM 6.

These deductions are 2 per cent. of the gross earnings in the case of underground men, and 1 1/2 per cent. for surface men. The compensation for this deduction is one-half pay for disability from accident; special indemnity being provided for fatal or more serious accidents.

Hospital.—This account covers deductions made from the gross earnings of employees on account of "Hospital Insurance." Each employee is charged one dollar for each calendar month, receiving in compensation therefor surgical and medical attention in all cases of sickness or accident, together with hospital accommodations whenever necessary.

Supplies.—This account is made up of the following sub-divisions:

| | |
|------------|-------------------|
| Storehouse | Lumber and Timber |
| Explosives | Fuel. |

MINE—SUB-ACCOUNTS

Breaking Ore.—This account is made up of the following charges:

| | |
|--------------------------------|----------------------------|
| Machine men and helpers, labor | Explosives |
| Hand miners, labor | Machine Drills, proportion |
| Miners supplies | |

This account is closed into Stoping each month.

Tramming.—This account is made up of the following charges:

Trammers, labor
Tramming (Distributed Account)—proportion.

This account closed into Stopping and Development accounts each month on a tonnage trammed basis.

Timbering.—This account is made up of the following charges:

Timbermen and Helpers, labor
Lumber and Timber
Timbering (Distributed Account)—proportion

This account is closed out each month to Stopping and Development accounts on a basis of cost of work done.

Hoisting.—This account is made up of the following charges:

| | |
|------------------|-------------------------------|
| Engineers, labor | Skip Tenders, labor |
| Oilers, labor | Boiler Room for steam |
| Topmen, labor | Supplies |
| Cagers, labor | Repairs to Building and Equip |

This account closed out each month to Stoping and Development accounts on a basis of tons hoisted.

Sorting and Loading.—This account is made up of the following charges:

| | |
|-----------------------|-----------------------------------|
| Sorting ore, labor | Supplies |
| Loading ore, labor | Boiler Room for steam |
| Tramming waste, labor | Repairs to Ore Houses and Equipt. |
| Washing Ore, labor | |

This account closes into Stoping each month.

Other Expense.—This account is made up of the following accounts:

| | |
|-----------------------|-----------------|
| Pumping | Repairs |
| Lighting | General Expense |
| Assaying and Sampling | Office Expense. |
| Surveying | |

This account closes out into Stoping and Development accounts each month on a basis of tons trammed.

Drifts.—This account is made up of the following charges:

| | |
|----------------------------|----------------------------|
| Miners and Helpers, labor | Tramming, proportion |
| Hand miners, labor | Hoisting, proportion |
| Miners' supplies | Timbering, proportion |
| Explosives | Other Expense, proportion. |
| Machine Drills, proportion | |

This account closes out into Development account each month.

Cross-cuts.—This account is similar to the above.

Raises and Winzes.—This account is similar to the above.

Shaft No. 1.—This account is similar to the above.

Shaft No. 2.—This account is similar to the above.

Shaft No. 3.—This account is similar to the above.

Portland Mill.—This account consists of an arbitrary treatment charge assessed against the mine by the mills, for the reduction of the ores produced by the mine. The charge is based upon the assay value of each lot of ore, each day's shipment constituting a lot. The scale of charges follows the prevailing rates charged by the custom mills and smelters.

Freight.—This account is charged with the freight paid on shipments of ore to the Colorado Springs mill. It is distinct from the freight charges on supplies shipped in, which charges are debited directly to the supply accounts.

Victor Mill Tramming.—This account is charged with the labor of motorman and a proportion of the Electric Plant for power, and covers the cost of running a 5-ton motor car between the mine and the Victor mill.

Buildings.—This account is charged with all labor, supplies and other expenses incident to the construction of all buildings of a permanent nature. In making charges against this account, the particular building affected is specified so that the charge will go against the proper account.

This account closes into Plant Account each month.

Machinery.—This account is charged with the first cost of all machinery plus the freight on the same, and all labor and supplies incident to the erection of the same. In making charges to this account the particular piece of machinery of the plant affected is specified so that the charges will go against the proper accounts.

This account closes into Plant Account each month.

Headworks.—This account is charged with all labor and supplies incident to the erection of the Headworks at each shaft, including sheaves, etc. In making charges to this account the shaft affected is specified so that the cost of the different Headworks can be kept separate.

This account is closed into the Plant Account each month.

Cars and Rails.—This account is charged with the first cost of all Tram Cars, Motor Cars, and Rails.

This account is closed into Plant Account each month.

Pipe Lines.—This account is charged with all labor, supplies, etc., for the building of all water, air and steam lines. In making charges against this account the kind of a line being worked on is specified, in order to keep separate account of each kind of work. This account is closed into the Plant Account each month.

Tools and Appliances.—This account is charged with all hand tools and portable equipment used at the mine, such as Compressed Air Drills, Machine Shop Tools, Wood-working Machinery, Drill-sharpening Machines, etc.

This account is closed into the Plant Account each month.

Stable Account.—This account is charged with the first cost of all live stock, wagons, buggies, harness, automobiles, motor trucks, etc.

This account is closed into the Plant Account each month.

Office Fixtures.—This account is charged with the first cost of all typewriters, adding machines, check perforators, etc., also the office furniture, and fixtures.

This account is closed into the Plant Account each month.

Storehouse.—This account is charged with all supplies bought that are not Explosives, lumber and Timber or fuel. Supplies used are credited at the end of the month.

Explosives.—This account is charged with all explosives bought and at the end of the month are credited with all explosives used.

Lumber and Timber.—This account is charged with all lumber and timber bought and at the end of each month is credited with the amount used.

Fuel.—This account is charged with all the fuel bought and at the end of the month receives credit for the quantity used.

MINE—DISTRIBUTED ACCOUNTS

Carpenter Shop and Surface.—This account is charged with the following:

| | |
|---------------------------|---------------------------------|
| Carpenter Foreman, salary | Electric Plant for power |
| Carpenters, labor | Surface expense |
| Supplies | Repairs to Building and Equipt. |

This account is closed out each month to the various accounts benefited on a basis of labor performed.

Blacksmith Shop.—This account is charged with the following:

| | |
|--------------------------------|---------------------------------|
| Blacksmiths and helpers, labor | Fuel |
| Supplies | Repairs to Building and Equipt. |

This account is closed out each month to the various accounts benefited on a basis of labor performed.

Machine Shop.—This account is charged with the following:

| | |
|-------------------------------|---------------------------------|
| Master Mechanic, salary | Electric Plant for power |
| Machinists and helpers, labor | Repairs to Building and Equipt. |
| Supplies | |

This account is closed out each month on a basis of labor performed to the various accounts benefited.

Boiler Room.—This account is charged with the following:

| | |
|----------------|---------------------------------|
| Firemen, labor | Water (paid by voucher) |
| Fuel | Repairs to Building and Equipt. |
| Supplies | |

This account is closed out each month on a basis of steam used. Each engine is equipped with a revolution counter, and the Master Mechanic furnishes the clerk with a distribution of the steam used; figured from the size of the engines and the revolutions made during the month.

Compressing.—This account is charged with the following:

| | |
|------------------|----------------------------------|
| Engineers, labor | Boiler Room for steam |
| Supplies | Repairs to Buildings and Equipt. |

This account is closed out each month on a basis of Air used, it generally goes entirely to the Machine Drill account.

Machine Drills.—This account is charged with the following:

| |
|---------------------------|
| Repairs to Drill Machines |
| Sharpening Steel, etc. |
| Compressor for air used. |

This account closes out into Stopping and Development sub-accounts each month on a basis of Drill Shifts worked by the machines.

Machine Man's Report.—Each machine drill miner makes out one of

these reports for the shift he works, Fig 200, form No. 2. These reports show the place working and give a complete record of the progress of drilling, steel received and dulled, explosives received and used, a distribution of their working time, notes on any breakages, also complaints.

These reports go to the Mine Foreman, and are later turned over to the Mine Office.

| | |
|-------------------------------------|----------------------------|
| Form M 2 2-24-12—25M | |
| The Portland Gold Mining Co. | |
| MACHINE MAN'S REPORT | |
| Shaft No. | Level M. Shift |
| Place | |
| Kind and Size of Drill Used | |
| Number of Holes | Total Feet Drilled |
| Number of Drills Received | |
| Number of Drills Dulled | |
| Powder Received | Sticks |
| Powder Used | Sticks |
| Number | Ft. Fuse Received |
| Number | Ft. Fuse Used |
| Time Actual Drilling | Hours |
| Mucking | Hours |
| Barring Down | Hours |
| BREAKAGE: | |
| Machine | |
| Drills | |
| Timbers | |
| COMPLAINTS: | |
| Air Line | |
| Poor Steel | |
| Air Pressure | |
| Poor Machine | |
| No Timbers | |
| Missed Holes | |
| REMARKS: | |
| DATE | |
| NAME | Machine Man. |

FIG. 200.—FORM 2.

The information contained in these reports is posted daily to the Distribution Sheets for the various underground openings affected.

Auxiliary Hoists.—This account is charged with the following:

| | |
|------------------|------------------------|
| Engineers, labor | Supplies |
| Cagers, labor | Boiler Room for steam. |

As these "Dinkeys" or third compartment hoists are used principally for lowering timber, and handling steel both in and out of the mine, the account generally closes out to "Timbering" and "Machine Drills."

Hoisting.—This account is charged with the following:

| | |
|---------------------|--------------------------------|
| Engineers, labor | Boiler Room for steam |
| Oilers, labor | Supplies |
| Topmen, labor | Shaft Repairs |
| Cagers, labor | Repairs to Building and Equip. |
| Skip Tenders, labor | |

In making charges to this account the following sub-divisions are made, Hoisting, Top Trimming, and Shaft Repairs.

This account is closed out each month to Stopping and Development accounts on a basis of tons hoisted.

Hoist Report.—The Top man at each shaft makes out for each shift a Hoist Report, Fig. 201, form No. 23. These reports show the material hoisted and the grade, also the levels from which it comes. These reports and the Trammer's Reports for the same shaft and shift must check.

| The Portland Gold Mining Co. | | | | | | | | | |
|--------------------------------|-------------|-------------------|---------------|-------|---------|--|--|---------------------------------|---------|
| Form M-23—2M—8-29-11 | | | | | | | | | |
| HOIST REPORT, SHAFT NO. _____ | | | | | | | | | |
| O'Clock Shift. _____ 191 _____ | | | | | | | | | |
| Level No. | Cars of Ore | Cars of Mill Dirt | Cars of Waste | Water | | | | Cars Waste Dumped in Old Stopes | Remarks |
| Tunnel, | | | | | | | | | |
| 200 | | | | | | | | | |
| 400 | | | | | | | | | |
| | | | | | | | | | |
| 1000 | | | | | | | | | |
| 1100 | | | | | | | | | |
| 1200 | | | | | | | | | |
| Totals | | | | | | | | | |
| Foreman. | | | | | Topman. | | | | |

FIG. 201.—FORM 23.

Electric Plant.—This account is charged with the following:

| |
|--|
| Machine Shop—Labor of electrician; repairs to plant |
| Electric Power—commercial; (paid by voucher) |
| Supplies—lamp renewals, transmission lines, repairs. |

Account is closed out each month into accounts using electric power, such as Carpenter Shop, Machine Shop, Haulage System, and Lighting.

The basis of the distribution into these accounts is shown by watt-meter readings.

Waste Haulage System.—This account is charged with the following:

| |
|--|
| Haulage engineers, labor |
| Electric Plant for power |
| Repairs to tracks and equipt. |
| Operation and maintenance of Elevators and Belt Conveyors. |

The following sub-divisions are shown for this account.

| |
|-----------------|
| Motor cars |
| Elevators |
| Belt Conveyors. |

This account out each month into "Ore Houses" (Tramming Waste).

Ore Houses.—This account is charged with the following:

| | |
|--------------------|--|
| Sorting Ore, labor | Boiler Room for steam |
| Loading Ore, labor | Supplies |
| Washing Ore, labor | Tramming Waste (Waste Haulage System). |

The following sub-divisions are shown for this account:

| | |
|---------|----------------|
| Sorting | Tramming Waste |
| Loading | Washing. |

This account is closed out each month into "Sorting and Loading" a sub-account of Stopping.

Tramming.—This account is charged with the following:

| |
|------------------|
| Supplies |
| Tram car repairs |
| Track Repairs. |

This account closes out each month into "Tramming" a sub-account of Stopping.

Trammers' Tags.—Each trammer fills out and places on each car that he sends up a tag, Fig. 202, form No. 13. This tag shows the grade of material in the car, where it was trammed from, where to and whether it was taken from a chute, plat or rough bottom. When the men are tramming waste for filling in old stopes, they make out one tag for the rock trammed from and to the same places, if they are changed about to different places they make out separate tags to cover the different places. When trammers are doing other work than tramming they must state so on a tag showing what they are doing and the time in hours for each job.

| The Portland Gold Mining Co. | | |
|---|-----------|--------------|
| TRAMMER'S TAG | | |
| O'Clock Shift, _____ 19____ | | |
| Ore | Mill Dirt | Waste |
| Trammed from _____ | | |
| Level No. _____ and Run to _____ | | |
| Taken from | | |
| Chute | Platt | Rough Bottom |
| To be delivered in Bin No. _____ | | |
| Trammer. | | |
| <small>Trammers will indicate whether "Ore," "Mill Dirt," or "Waste," by putting an X underneath the word; the same with "Chute," "Platt" or "Rough Bottom." Fill in and date blanks, sign name and send out with car. If on other work than tramping, state number of hours.</small> | | |

FIG. 202.—FORM 13.

All these Trammers' Tags are taken up by the Cagers at the different shafts when the cars are dumped, at the end of the shift they are turned into the office, sorted out and counted, the count being entered on the Distribution Sheets for the various underground openings effected.

Timbering.—This account is charged with the following:

Supplies
Delivering timber
Auxiliary Hoists, proportion.

This account is closed out each month to "Timbering" a sub-account of Stopping.

Timberman's Report.—The Timberman make out each shift a report, Fig. 203, form No. 12, for each place timbered during the shift showing the place and material used in detail.

These reports go to the Head Timberman who makes out for each place timbered during the month, a Timber Report, Fig. 204, form No. 24. The details of the daily reports are posted to these Timber Reports, showing for each day worked, the kinds and quantities of material used on the different jobs.

These reports go to the Supply Clerk at the end of the month, and have the cost of the timber entered on them.

| Portland Gold Mining Co. | |
|----------------------------------|--|
| TIMBERMAN'S REPORT | |
| O'Clock Shift _____ Date _____ | |
| Level _____ Slope or Drift _____ | |
| Posts | |
| Caps | |
| Sills | |
| Ties | |
| But Caps | |
| Stulls | |
| Lagging | |
| New | |
| Raised | |
| Sprags | |
| Ladders | |
| Planks, Ft. | |
| Timberman | |

FIG. 203.—FORM 12.

| The Portland Gold Mining Company | | | | | | | | | | | | | |
|----------------------------------|-------|------|------|-----------|-------|----------|--------|---------|---------|------------|-------|--------|---------|
| TIMBER REPORT | | | | | | | | | | | | | |
| Month of _____ 19____ | | | | | | | | | | | | | |
| Day | Posts | Caps | Ties | Butt Caps | Sills | Cribbing | Stulls | Lagging | Helpers | Planks—Ft. | Slabs | Wedges | Ladders |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | |
| Cost | | | | | | | | | | | | | |

FIG. 204.—FORM 24.

Fuel.—All fuel used is charged to this account. The Master Mechanic reports to the Supply Clerk the weight of coal used each month. This account is closed out to the different accounts benefited on a basis of fuel used.

Lumber and Timber.—This account is charged with all lumber, timber, poles, lagging, ties, ladders, wedges, etc.

This account is closed out each month to the various accounts benefited according to the value of the material used.

In making charges to this account, it is necessary to specify the job or place in order to make a proper distribution of the account.

Explosives.—This account is charged with all explosives used, that is, powder, caps and fuse, together with the cost of handling same.

This account is closed out each month to the various accounts benefited according to the value of the explosives used.

In making charges to this account, the particular opening to which the material goes is specified.

Ammunition Order.—Each Machine miner makes out an Ammunition Order, Fig. 205, form No. 11, for his day's supply of explosives. These orders are filled by the Powderman, the material being delivered to the proper working places.

| THE PORTLAND GOLD MINING CO. | | | |
|--|---------------|------------|---|
| AMMUNITION ORDER | | | |
| O'Clock Shift. | | 190 | |
| Level. | Place Working | | |
| Sticks 1½" Powder. | | | |
| " | ¾" | " | |
| Lengths Fuse | | Feet Long. | |
| " | " | " | " |
| " | " | " | " |
| Machine Man. | | | |
| In sending in above order, Machine Men must fill out the blanks indicating the level and place working. Always sign your orders. | | | |

FIG. 205.—FORM 11.

The Powderman makes out a Powderman's Report, Fig. 206, form No. 3, for each opening that is active during the month. The Ammunition Orders are posted to these reports each day in detail showing the date, quantity and kind of powder, fuse and caps delivered.

These reports are turned in to the Supply Clerk at the end of each month and have the values entered on them, the information is then posted to the supply records, etc.

| THE PORTLAND GOLD MINING CO. | | | | | | | | | | Form M 3 |
|------------------------------|-----------------|----------------|-----------------|------------------|------------|------------------|-----|----------------|--|----------|
| POWDER MAN'S REPORT | | | | | | | | | | |
| Month | | | | | Place | | | | | 191 |
| Level | | | | | | | | | | |
| Day | 1½" Powder lbs. | ¾" Powder lbs. | Powder 60% lbs. | Powder 100% lbs. | Fuse, Feet | Water Fuse, Feet | Cap | Cap Protectors | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

FIG. 206.—FORM 3.

Supplies.—This account is charged with all supplies used that are not covered by specific accounts, such as Timber and Explosives.

In making charges for supplies used the particular job must in all cases be stated, to enable the accounting clerks to make a proper distribution of the charges on the Supply Records.

This account is closed out each month to the various accounts benefited on a basis of the value of supplies used.

Pumping.—This account is charged with the following:

| | |
|----------------|-----------------------|
| Pumpmen, labor | Boiler Room for steam |
| Supplies | Pump repairs. |

This account closes out each month to "Other Expense," a sub-account of Stopping.

Lighting.—This account is charged with the following:

| | |
|--------------------------|----------|
| Electric Plant for light | Candles. |
|--------------------------|----------|

This account closes out each month to "Other Expense," a sub-account of Stopping.

Assaying and Sampling.—This account is charged with the following:

| | |
|-----------------|--------------------------------|
| Assaying, labor | Electric Plant for power |
| Sampling, labor | Fuel |
| Supplies | Repairs to Building and Equip. |

This account closes out each month into "Other Expense," a sub-account of Stopping, on a tonnage basis.

This account represents the cost of taking daily samples in each of the working stopes and development places, and keeping a record of same.

All assays made are reported on blanks used for that purpose, Fig. 207, form No. 10, showing the consecutive assay number, description of the samples, contents and values.

| Portland Gold Mining Co. | | | | | Form M 10—5M—11-15-11 | | | | |
|---|-------------|------|-------|--|-----------------------|-------|------|--|--|
| ASSAY OFFICE | | | | | Victor, Colo., _____ | | | | |
| I hereby certify that the samples assayed for _____ gave the following results per ton: | | | | | | | | | |
| No. | Description | Gold | | | | Value | | | |
| | | oz. | hdth. | | | \$ | cts. | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Office at PORTLAND MINES | | | | | Assayer _____ | | | | |

FIG. 207.—FORM 10.

Surveying.—This account is charged with the following:

Engineers, salary
Assistants, labor

Supplies.

This account closes each month into "Other Expense," a sub-account of Stopping.

Repairs.—This account is charged with the labor and supplies used in making general repairs about the mine—repairs which are not directly chargeable to the accounts mentioned above, as noted. It closes out each month into "Other Expense," a sub-account of stopping.

General Expense.—This account is charged with the following:

Superintendent's salary
Mine Foreman's salary
Shift Bosses' salary
Supplies
Boiler Room for steam heat for buildings.

This account closes out each month into "Other Expense," a sub-account of Stopping.

Office Expense.—This account is charged with the following:

Chief Clerk, salary
Timekeeper, salary
Supply clerk, salary

Supplies
Telephone and Telegrams.

This account closes out each month into "Other Expense," a sub-account of Stopping.

Victor Mill Account.—This account is charged with the amounts of labor performed, and supplies furnished, for the benefit of the Victor mill. It closes out each month into "Accounts Receivable."

GENERAL STATEMENT OF ACCOUNTING

The only account books used at the mine are the

Petty Cash Book
Voucher Register, and
Pay-roll.

Cash Book.—All funds received by the company at the mine are entered in the Cash Book in the usual way. All cash payments are entered in the Cash Book, showing distribution. The cash book is closed each month, and the balance remitted to, or received from, the treasurer, as the case may be, in order to keep the amount of cash on hand at the mine office a constant sum.

Voucher Register.—Entry is made in this register of all vouchers chargeable to the operation of the mine, and which have the approval of the mine manager, such as salaries of foremen and heads of departments, bills for water and electric power, etc. The distribution of the vouchers into the accounts benefited is also noted on the register, whence it is entered onto the "General Office" column on the cost-sheet for proper distribution.

Engaging Labor.—All persons seeking employment with the company, apply to the head of the department they wish to work in and if they are engaged, the foreman sends them to the office, where the Timekeeper makes out for each man employed a card, Fig 208, form No. 29. These cards call for specific information which in all cases must be complete. They are filed in a card index, alphabetically arranged. When an employee severs his connection with the company his card is removed from the live file, the date and the reason for leaving is noted on the card and it is filed in another file for future reference.

| | |
|---|--|
| Card No. _____ | Form M 29-5M-9-14-11 |
| Name _____ | |
| Age _____ No. _____ | Street, _____ Colo. _____ |
| Nationality _____ | Married _____ Years Experience _____ |
| Date Employed _____ | 191 _____ Occupation _____ Wages _____ |
| Last Employer _____ | |
| Reason for Leaving _____ | |
| In Case of Serious Accident, Notify _____ | |
| Address _____ | |
| Insurance? _____ | Signature _____ |
| Date of Leaving _____ | 191 _____ If Discharged, By whom _____ |
| Reasons _____ | Remarks _____ |

FIG. 208.—FORM 29.

When an employee resigns or is discharged, the foreman furnishes him with a Time Check, Fig 209, form No. 9. This check is an order on the Timekeeper to pay for a stated amount of time at a stated rate of pay. These orders are not negotiable.

| | | |
|--------------------------|---|-------------|
| No. _____ | The Portland Gold Mining Co. | |
| _____ 191 _____ | No. _____ | Time Check. |
| Name _____ | TO THE TIMEKEEPER, PORTLAND OFFICE: _____ 19 _____ | |
| _____ Shifts at \$ _____ | Due _____ | |
| Occupation _____ | Shifts at \$ _____ | |
| Reason _____ | For _____ in Month of _____ | |
| | Shifts. _____ | |
| | NOT NEGOTIABLE. | |

FIG. 209. FORM 9.

Upon presentation to the Timekeeper this check is compared with the Pay-roll and if correct the extension is made in the Pay-Roll, and a bank check issued in settlement of the person's account. The check number is entered in the Pay-roll; also the date of settlement.

Timekeeping.—The foremen of each department both on Surface and Underground keep the time of their men in ordinary monthly pocket time books. At the end of each shift these books are turned into the office, and the Timekeeper posts the time direct to the Pay-roll.

| PAY ROLL—THE PORTLAND GOLD MINING COMPANY—MINE DEPARTMENT. | | | | | | | | | | Pay Roll No. _____ |
|---|-------|------------|-------------|------|--------|------------|------|------|------------|--------------------|
| No. | NAMES | OCCUPATION | Base of Pay | | Amount | DEDUCTIONS | | | Amount Due | REMARKS |
| | | | Day | Rate | | Wage | Over | Time | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| | | | | | Total | | | | | |
| I CERTIFY THAT THE ABOVE NAMED PERSONS HAVE BEEN DILIGENTLY EMPLOYED DURING THE TIME SPECIFIED IN THE SERVICE OF THE PORTLAND GOLD MINING COMPANY, AND THAT THE OCCUPATIONS, RATES AND AMOUNTS ARE CORRECT. SUPERINTENDENT _____ MANAGER _____ | | | | | | | | | | |

FIG. 210.—FORM 1.

In entering names in the time books the foremen classify their labor, that is, the Shift Boss will group his Machine miners, Hand miners, Trammers, etc. The same idea of classifying is carried out by other foremen.

Pay-roll.—The Pay-roll which is a loose leaf book is made up directly from the Foremen's time books, the time being posted to the Pay-rolls each day. The Pay-roll used is a combination Time book and Pay-roll, Fig. 210, form No. 1.

At the end of each month the extensions are made and the Pay-roll proved. As soon as completed it is submitted to the Superintendent for inspection and then goes to the Manager for approval.

The pay-roll is kept in duplicate, the duplicate being retained at the mine office, while the original, as soon after the first of the month as completed, is forwarded to the treasurer's office, where bank checks are drawn and forwarded to the mine office, to be issued to the employees on the tenth of the month. No receipts are required from employees, the check, properly endorsed, being considered sufficient receipt.

Distribution of Labor.—This distribution is made up from the following reports:

| | |
|--------------------------|-------------|
| Carpenter Shop Report | Form No. 5 |
| Master Mechanic's Report | Form No. 17 |
| Blacksmith's Report | Form No. 18 |
| Ore House Report | Form No. 14 |
| Shift Bosses Reports | Form No. 4. |

And to the above is added the office force.

The various headings as required for the different jobs are written in on the Distribution of Labor sheets, Fig. 211, form No. 8. Separate

[illegible]

FIG. 211.—FORM 8.

sheets are carried for the different classifications of labor. The time is posted to them daily.

The total time as shown by the distribution of any classification of labor must check with the time for that classification. The whole time for all classifications must check with the total time as shown by the Pay-roll.

The Carpenter Foreman makes out each day a Carpenter Shop Report, Fig. 212, form No. 5, giving a distribution of the labor of his men for the day. This report is turned into the mine office each evening.

The Master Mechanic makes out each day a report showing a distribution of the labor of his men for the day on Fig. 213, form No. 17.

| THE PORTLAND GOLD MINING COMPANY | | |
|----------------------------------|------------------------|------------------------------|
| | Portland, Colo., _____ | 190_____ |
| CARPENTER SHOP REPORT | | |
| SHIFTS | @ | OCCUPATION |
| _____ | _____ | Carpenters in Shop _____ |
| _____ | _____ | Sawyers in Shop _____ |
| _____ | _____ | Sawyer Helpers in Shop _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Carpenters on _____ |
| _____ | _____ | Men Cutting Lagging _____ |
| _____ | _____ | Men Cutting Plank _____ |
| _____ | _____ | Men on Cribbing at _____ |
| _____ | _____ | Men on Cribbing at _____ |
| _____ | _____ | Men in Lumber Yard _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | Foreman _____ |
| _____ | _____ | Total _____ |

Carpenter Foreman.

FIG. 212.—FORM 5.

This report which covers all men in the Master Mechanics department is sub-divided between the three shafts. This report is turned into the mine office each morning.

In order to facilitate the cost keeping methods each machinist makes out each day an individual report of his labor for the day, showing the various jobs that he has worked on and the number of hours spent on each. Fig. 214, form No. 16.

These reports are made out by the men and turned in to the Master Mechanic at the end of each shift.

The Master Mechanic condenses this information for making up his daily report. The detailed information is used in making up the cost for Shop Requisitions.

FIG. 215.—FORM 18.FIG. 216.—FORM 7.FIG. 217.—FORM 14.

| SHAFT NO. _____ | | SHIFT REPORT | | | | | | | | | | M. SHIFT _____ | |
|----------------------|-----------|--------------|---|--------|--------|--------|--------|--------|--------|--------|--------|----------------|------------------|
| WORK DONE THIS SHIFT | | | RECAPITULATION OF WORK DONE IN STOPES AND DEVELOPMENT | | | | | | | | | | |
| | IN STOPES | DEVELOPMENT | GENERAL | | | | | | | | | | |
| OCCUPATION | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts | Shifts |
| Machine Men | | | | | | | | | | | | | |
| Machine Helpers | | | | | | | | | | | | | |
| Hand Miners | | | | | | | | | | | | | |
| Muckers | | | | | | | | | | | | | |
| Stope Sweepers | | | | | | | | | | | | | |
| Trammers | | | | | | | | | | | | | |
| Timberman | | | | | | | | | | | | | |
| Timber Helpers | | | | | | | | | | | | | |
| Nippers | | | | | | | | | | | | | |
| Pipe and Track Men | | | | | | | | | | | | | |
| Cagers | | | | | | | | | | | | | |
| Topmen | | | | | | | | | | | | | |
| Car Greasers | | | | | | | | | | | | | |
| Powdermen | | | | | | | | | | | | | |
| Scavengers | | | | | | | | | | | | | |
| Mud Ball Men | | | | | | | | | | | | | |
| Timber Rustlers | | | | | | | | | | | | | |
| Shaftmen | | | | | | | | | | | | | |
| Shift Boss | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | |
| Remarks _____ | | | | | | | | | | | | | Date _____ |
| _____ | | | | | | | | | | | | | Name _____ |
| _____ | | | | | | | | | | | | | Shift Boss _____ |

FIG. 218.—FORM 4.

| REQUISITION BLANK | | Form M-28 1M-5-26-11 |
|----------------------------------|--|----------------------|
| THE PORTLAND GOLD MINING COMPANY | | |
| MINE DEPARTMENT | | |
| VICTOR, COLO., _____ 191__ | | |
| Please order for _____ | | |
| _____ | | |
| _____ | | |
| _____ | | |
| _____ | | |
| _____ | | |
| Approved: _____ | | |
| Storekeeper. | | |
| Superintendent. | | |

FIG. 219.—FORM 28.

These reports are turned into the mine office at the end of each shift.

Storehouse Department.—All material for the mine and mills is procured through the Purchasing Agent.

As material is required to replenish the storehouse stock or for special jobs, the Storekeeper makes out a Requisition, Fig. 219, form No. 28, in duplicate, specifying the quantity and kind of material required. These Requisitions must have the approval of the Superintendent before being forwarded to the Purchasing Agent. The original copy goes to the Purchasing Agent, and the duplicate is placed on file.

Purchase Orders.—In the purchase of supplies the Purchasing Agent issues orders numbered in triplicate; the original copy goes to the seller, the duplicate to the files, and the triplicate to the mine or mill making the Requisition.

Material Received Register.—All shipments received, both freight and express, are entered in the Register of Material Received, Fig. 220, form No. 20. This register calls for full data covering the Date received, Freight bill date and number, Consignor, Number of Packages, and an itemized list of material showing quantity, kinds and weights, Purchase order number, also the freight charges.

Invoices.—All invoices are received by the Purchasing Agent and checked as to prices, extensions and footings; they are forwarded to the mine or mill concerned.

The invoice goes to the Storekeeper, who enters the date, costs, discounts, etc., in the Register of Material Received, against the various items covered by the invoice. If the goods have not been received the invoice is held until they arrive. The invoices are then O. K.'d by the Storekeeper for receipt of material and turned over to the mine or mill clerk for Vouchering. All invoices are entered in the Voucher Register and vouchered before payment.

Stores Records.—To keep an accurate detailed record of all stores purchased and used, also to carry a perpetual inventory, a stores card index is used, Fig. 221, form No. 21.

A separate card is made out for each article, kind or size of material as required. These cards are indexed and also grouped under class heads, such as Nails, Oils, lumber, etc., to facilitate the work of the storekeeper.

All material received is posted from the Register of Material Received to these cards, showing the quantity, total cost and consignor. This work is done from day to day by the Storekeeper, following closely upon the posting of the invoices to the Register.

The Storekeeper when entering the values on the "Orders on Storekeeper," also posts to the cards the quantity, value and account chargeable for material used.

[illegible]

FIG. 220.—FORM 20.

[illegible]

FIG. 221.—FORM 21.

At the end of each month after all invoices for the month have been posted and the entries made on the cards for all material received, the balance of the stores used are posted and the cards are balanced, showing in the balance column the quantity and value as of the first of the month. Once a year the cards are checked against the actual count or weight of material on hand.

Stores Used Records.—Stores are delivered only on the presentation of an "order" properly signed by some one authorized to sign such orders. These orders are posted to the Stores cards and the values entered on the orders at the same time.

| | | |
|---|-------|--|
| <h1 style="margin: 0;">THE PORTLAND GOLD MINING CO.</h1> <h2 style="margin: 0;">ORDER ON STOREKEEPER</h2> | | |
| | 190__ | |
| Storekeeper will please deliver to bearer and charge to _____ | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| _____ Foreman. | | |

FIG. 222.—FORM 22.

Form M-25 10-28-10 2M

THE PORTLAND GOLD MINING COMPANY

(MINE DEPARTMENT)

STORE ROOM DISTRIBUTION

FIG. 223.—FORM 25.

A summary of the stores used each day is entered on a Daily Store Room Distribution, Fig. 223, form No. 25. In making up this report the charges against the various accounts are grouped and the charges against each account is subdivided to show the various kinds of material used, also the quantity and value. This report is made out by the Storekeeper and turned into the mine office.

The daily report or Store Room Distribution is posted to a Record of Stores Used, Fig. 211, form No. 8 (same as labor distribution), which is the permanent record of material used for the month. On this record the charges are shown under the various accounts benefited.

Physical Report.—A Daily Labor and Production Report, Fig. 224, form No. 27, is made out by the mine clerk each morning and forwarded to the President of the company. This report shows a distribution of the labor for the day, an analysis of the material hoisted, also a distribution of the shipments.

Physical Report. Monthly.—This report is made out each day from the Daily Physical Report. The report is cumulative, giving an accurate statement of the Labor, Production and Shipments.

This report is kept in the Manager's office for ready reference.

Watchman's Report.—The Watchman makes out during his shift a

Form M-15—1M-3-30-11

THE PORTLAND GOLD MINING CO.

WATCHMAN'S REPORT

Date _____ 191____

| BOX NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------|---|---|---|---|---|---|---|---|---|
| P.M. 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 12 | | | | | | | | | |

| | | | | | | | | | |
|--------|--|--|--|--|--|--|--|--|--|
| A.M. 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |

Remarks: _____

Watchman

FIG. 226.—FORM 15.

report, Fig. 226, form No. 15, showing the time that he passed the different boxes on his rounds. This report goes to the Superintendent.

Ore Register.—An ore register is kept at the mine office, showing on the left-hand page the lot number of each shipment, the numbers of the cars in which it was shipped, the gross, tare and net weight of each car. On the right-hand page is shown the mill settlements; the deductions for moisture, the mine and mill control assays and umpire assay, if any; the settlement assay, gross value of the lot, deductions for freight and treatment charges, and net returns to the mine.

Shipping Report.—For each lot of ore shipped there is a Shipping Report made out like the following:

[illegible]

FIG. 227.—FORM 30.

Stope and (or) Development Sheets.—At the end of each month two reports are made out, one to cover the months operations in all the active stopes of the mine and the other to cover the month's operations in all the active Development openings of the mine. These reports show the active openings listed. The information called for by the headings on the sheets is taken from the Distribution Sheets, form No. 6. The heading on the Stope sheet marked General Expense covers, Pumping Lighting, Assaying Surveying, Repairs, General Expense and Office Expense. The total cost on the Stope sheet equals the Stopping account in the ledger. The total cost on the Development sheet equals the Development account in the ledger. These reports go to the Manager.

General Cost Sheet.—The Cost Sheet, Fig. 229, form No. 40, is made up as soon after the end of the month as possible. This Cost Sheet, which shows all the mine expense accounts, is kept on the co-ordinate

FIG. 228.—FORM 19.

FIG. 229.—FORM 40.

The direct charge of labor against the various accounts is shown in the Pay-roll column. In the General Office column is shown a summary of the Voucher Register for the month. Other Expense, which is a sub-account of Stopping covers the following items; Pumping, Lighting, Assaying, Surveying, Repairs, General Expense, and Office Expense.

The essential feature of the system is that all work is done under a serial system of numbering of cross-cuts, raises, winzes, stopes, and any class of opening that may occur underground. That is in any given mine we begin with No. 1 for each class of work on each level and

[illegible]

FIG. 230.

Having a description of the way the office records are kept and illustrative forms, it will be an easy matter to understand the necessary form of note book used for various classes of field work.

[illegible]

FIG. 231.

The forms are printed on 5 in. x 8 in. cards. There are eight standard forms besides the markers. These forms are Survey, Sketch, Elevation, Measurement, Raises and Winzes, Stopes, Total cards for Measurements, and Total cards for Stopes.

of the card gives space for recording the number of sets taken out each month during the years 1902 to 1910. It also shows the colors used for each month and the cross-hatching for each six months. Thus by reference to any stope, we can tell the number of sets stoped in any month of any year and their exact location. There are as many cards to each stope as there are floors. The back of this card is blank.

Figure 238 is our Measurement card. It is unnecessary to fill in any of the headings or columns on this form for illustration, as they are so arranged as to be used for all measurement totals. For example take the card heading "Monthly record of All," this can be followed by "Raises and Winzes," or Sub-Raises and Sub-Winzes or Cross-cuts, or Sub-cross-cuts or Openings, written in the blank space. After "On," the blank may be filled by any particular level number as 1150 or by "All," meaning all levels in that mine. This card is also applicable for one month in any year, or follow the word month with "All" and it becomes a total card for the whole year. Under the first column head-

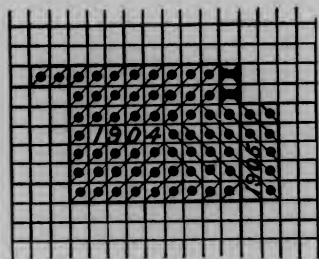


FIG. 237a.

ing "Name of" put whatever the card is being used for in half space, such as "Cross-cut" or "Winze," then below this on the lines, will follow the numbers of the particular openings designated. The entries under any month are totaled at the foot of the card, the total is carried to the reverse side of the card, and from there it can be carried to another card and so on indefinitely. At the end of the year (say 1912) the entries of openings are cross totaled and entered in the column headed "Feet Extended." The sum of the twelve column totals under months will check and equal the total of the column headed "Feet Extended." In the next column headed "Total Length" December 31, 1911, we have the total length of the opening copied over from the previous year. This figure plus the feet extended equals the total length December 31, 1912. As a final check on the figures, the sum of the totals of columns "Feet Extended" and "Total Length" December 31,

1911, is equal to the total of column "Total Length" December 31, 1912. The back of this card is a duplicate of the face.

The "Stopes Total card" shown as Fig. 239, is very elastic in its use similar to the Measurement total card. It can be used for the stope totals of one level in a mine, or all levels, or for one or all months, as the case may demand. The column headings are self-explanatory after the descriptions of the total cards for measurements.

The object of these total cards is so that at any time we can get the work (either stoping or development work) done up to the given time. This is very easily accomplished with this form of card and it can be done by any engineer, whether he posted the work or not. The back

| MONTHLY RECORD OF ALL _____ ON _____ LEVELS IN _____ MINE _____ | | | | | | | | | | | | | | | |
|---|---------------|------|-------|------|-----|------|------|------|------|------|-------|----------|------------|-------------|-------------|
| MEAS'T BOOKS | | | PAGES | | | | | | YEAR | | MONTH | | | | |
| NAME OF | FEET EXTENDED | | | | | | | | | | | FEET EX. | TOT. L'GTH | TOT. L'GTH | |
| | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEP. | OCT. | NOV. | DEC. | YEAR | DEC. 31, 19 | DEC. 31, 19 |
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FIG. 238.

of this card is printed the same as the face, excepting that at the bottom it reads "Continue to Card No. . . .", instead of continue on other side.

The arrangement of the cards in the boxes is merely a matter of detail. We use groups of ten subjects for each marker, that is, in front of the marker "Survey" there would be the survey of ten cross-cuts serially. The main numerical markers No. 1 and No. 10, Fig. 232, are of yellow cardboard, General markers, such as are used to designate "Level Totals," Fig. 232, are a reddish cardboard. There are other special markers, but it is not necessary to describe them here. In general the records of the mine are kept in one or more drawers marked to that effect on the front. If there are records of more than one mine in a drawer, the records of each are kept separate by sub-markers.

It can be seen from the foregoing what all the forms used for keeping notes of the field work are. Fig. 231 is on the reverse side of the Survey card (Fig. 230), and it has the same columns and headings as the pages of the survey field book. This gives us an exact reproduction of our field notes, so if a field book is lost we have all the notes as taken. For elevation and measurement, the form used in the field is identical with

are not accurate enough for close work, yet if an error of two or more degrees is made at any given point, the several readings of the needle at succeeding points in the survey will indicate about where the error was made. It is for this reason that magnetic bearings are taken.

The heading of the next column is self-explanatory. "H. P." is the vertical distance from the line of sight to the brass tag at the forward station. From this tag the distance is measured to the floor and recorded in the column "Station to Floor." For surveying purposes, the elevations of the brass tags are calculated, while for the use of the manager, superintendent and mine foreman, the elevations of the Floors are determined.

"Horizontal Distance" contains either actual horizontal distance measured or reductions from slope distances.

The last space, "Description" is cross-sectioned sixteen squares to the square inch. It occupies about three-fourths of one single page and is used for the description of the survey stations, side points, and for sketches of mine openings, etc.

The surveys are made and recorded in such a manner that all openings with the square sets therein, also all surface improvements and natural objects, contours, etc., can be accurately platted. The notes of all surveys are recorded in chronological order from the beginning to the end of each book. This brings all survey stations numbers in order through the books, but in continuing the work from month to month, any place surveyed more than once will appear only in its regular monthly order. An index of all such places is kept in the front of each book.

The field notes having been taken and recorded in the manner described, are now reduced in the office. The surveyor and his assistant have calculation books paged alike, and upon pages numbered the same, make like reductions, both working together and making comparison as the work progresses. The observed angles are reduced to azimuths, and the bearings determined therefrom by inspection. Horizontal and slope distances are calculated from the vertical angles and slope distances. The coordinates and elevations of all the survey stations are calculated. The zero point of the coordinate system was established in such a manner that almost all the stations located are north and east of that point. The elevations are given in feet above sea level. In these calculations "Gurden Traverse Tables" and "Vega Logarithmic Tables" are used.

As soon as the calculations are made, the number of the page in the calculation book where the work is done, is marked in ink in the field book, so that every figure used in the calculations can be found at any time by reference to the field book, and then to the page in the calculation book.

In order to preserve the notes in case of loss or damage of a field book, complete office records of all the essential features of the field notes are kept. These records are in ledgers 11 in. \times 14 in. In addition to the headings given in the field books the ledgers have the following; "Azimuth," "Vertical Distance," "Latitude N. S.," "Departure E. W.," "Ordinate N. S. E. W." "Elevation," "Floor Elevation," "Page in the Field book." In these columns are recorded the office deductions. The sketches made in the field books as are not copied in the ledgers, but are platted with the regular monthly surveys, and thus preserved. The ledgers have an index of all places surveyed, exactly like the index in the field books.

All station numbers are indexed in books made for that purpose, the headings for which are "Station," "Page in ledger," "Page in field book," "mine." No duplicate survey numbers are used in any of the company work. All corners of mining claims owned by the company have been located and indexed. The index book contains the name of the claim, the lot and survey number, the location and description of each corner with the markings thereon the coordinated, page in the ledger where the survey is recorded, bearings and distances from corner to corner as determined by calculations from the coordinates, and page in the calculation books where the calculations were made. All of this data is recorded in columns which have printed headings descriptive thereof.

For a better preservation of all underground work, several years ago, a complete set of office stope books were made. These books are 18 in. \times 24 in. The pages are ruled with coordinate lines in the process of manufacturing as it was found that the ruling could be done by the printing office much more accurately than by hand, and at far less cost. Each double page contains 176 squares, 2 in. each way, or, with the scale used in platting, 50 ft. to the inch, each double page covers a territory of 800 ft. by 2200 ft. There are at the present time six sets of these books covering all the principal mining operations of the company, and if placed together in proper relation, would include ground described as follows: north 3200 ft., east 2200 ft., north 800 ft. east 2200 ft., South 1600 ft., west 2200 ft., south 2400 ft., and west 2200 ft. Each of these books contains 130 double pages, numbered alike. The first book in each set includes workings from the surface to and including the ninth level, the second book includes from the floor of the ninth, to and including the eighteenth level. The third book will include not over five levels. It has been found that nine levels are too many for one book.

The books are constantly in use, and the wear on them is too great for more than five levels. Underground workings of the company,

outside of those included in the books, are platted upon sheets of mounted drawing paper 18 in. \times 24 in., being the same size as one page of a stope book. These sheets are adjusted to the pages of the stope books, so as to form a continuation of the system used in the books. The coordinate numbers are hand printed at the top and side of each double page of all the books, and also on the mounted sheets. The books include the levels, with all the stope floors above the levels, so that when platted they contain a representation of all openings, with the square sets, at every interval of about 7.5 ft. in elevation throughout the mines, all being properly adjusted to the coordinates, and hence to each other.

The platting of the surveys is in order after the office work in connection with the field notes has been completed. This is done by scaling from the nearest coordinate lines north and east to the points for these survey stations, using the coordinates of the stations for the distances.

The platting is checked by scaling the distances from succeeding points. The square sets are then platted in proper relation to the survey, and the boundaries of the openings drawn as given from the special notes or sketches in the field books. Every square set is represented as it exists in the mine. This comprises the platting of the surveys in the books.

In order to preserve the books from unnecessary wear, the workings of each level in each mine are transferred to mounted sheets 28 in. \times 48 in., this size being sufficiently large to include all the workings of any mine. The station numbers are platted on these sheets from the calculated coordinates. From the mounted maps all tracings of levels and reductions to other scales are made.

For various uses, all levels are reduced by pantograph from the 50 ft. scale to 100 ft. scale, and from that to 200 ft. scale. All the reduced maps are upon mounted sheets of drawing paper, 18 in. \times 24 in., and are so related to the coordinate system that additional sheets can be added in any direction.

None of the maps described in this article are composite, each sheet representing one level only. Each level, except in the stope books, has a special color for that particular elevation. Water colors are used on mounted paper, and "no rinkle" or colored pencils on tracings. Colored pencils used on the dull side with india ink lines on the glazed side make the best maps. The colors are toned down with felt or chamois stumps. All the workings in the office stope books, including stopes, have a color for each year, the work being brought up at the beginning of the calendar year. All mine numbers are hand printed on all level maps, as well as in the stope books.

The surface survey is platted 50 ft. to the inch, upon mounted sheets covering all the property owned by the company. They are arranged

in numerical order, and show all streams, roads, ditches, shafts, tunnels, open cuts, buildings, railroads, and all claim lines, with shading around the boundary of the company property.

For general use, all the features on these sheets have been reduced to 100 ft. scales, upon mounted sheets of the same size as the 50 ft. scale maps. All of the surface sheets will be corrected from time to time as changes are made, and new sheets substituted for old ones. There is an index sheet for the surface maps of the same size. It shows all claims owned by the company drawn to scale of 800 ft. to the inch, and is cross-sectioned so as to represent the spaces occupied by the different surface sheets. Numbers from 1 to 240 are placed in the rectangular spaces, and the corresponding numbers, as used are printed upon the bottom of the surface sheets. Knowing the locality desired for examination, the index gives the sheet sought. By using one, four, or sixteen squares on the index sheets it is an index for 50 ft., 100 ft., and 200 ft. scale maps.

The stopes are measured or "taken up" as it is called, once a month, or oftener if it becomes necessary. For this work leather bound books 5 3/8 in. \times 11 1/2 in. in size are used. The pages are cross-sectioned, giving 16, 36, 64, or 100 squares to the inch. The boundaries of the square inches are heavier than all the other lines. The small veins are sketched in the books having the large squares, and the large veins in those having the small squares. Usually before going underground, the portion of the level where the stopes are to be located is sketched from the office stope books into the field book, the location of all chutes and survey stations being indicated, as in office books. In the field books, however, the drifts are made to follow the cross-section lines by indicating the bends by \vee or \wedge , as the drift bends either to right or left. The difference between the surveyed drift and the same drift sketched, will appear from Fig. 240.

The veins owned by the company run in an easterly and westerly direction, with usually a south dip. There are a few veins that dip to the north. The books represent the veins as viewed from the south.

In stoping up from a level on a south dipping vein the different floors will show offsets to the north. It is customary to give the number 10 to the first row of sets along the level on such a vein, using 11, 12, etc., for the offsets, either on the level or in the stopes. These numbers are carried in the chute sets, which are the reference sets for all of the floors of the stopes. On the level, the discharges of the chutes are sketched on the north side of the drift as they appear in the mine. On the first floor of the stope the chutes will then fall in 11, 12, etc. The posts standing on the level and in the stopes are represented by dots at the intersections of the printed lines in the books, while the chutes in the stopes are represented by squares which have their angles at the posts of

the chute sets. The stopes are sketched by counting the sets, indicating the posts and chutes as described, and by drawing the outlines around the openings. All bends or angles found in the stopes are located and sketched. Often measurements of irregular caps and girts are made, and sometimes it becomes necessary to carry a transit line into the stope. Within the sketches of the openings are recorded the dates upon which the stopes were "taken up." Usually but one floor is sketched on a page. When the veins dip north the row of sets on the level is numbered 10, and

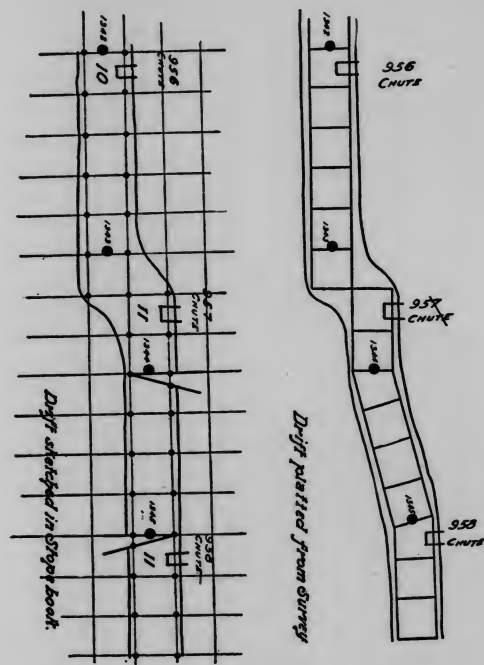


FIG. 240.

chutes show on the south side of the drift, the offsets in the stopes are numbered 9, 8, etc. After having been platted in the office, all notes in the field books are inked with indelible ink. The platting of the stopes in their proper position, relative to the coordinates in the office stope books, consists of carrying the lines of the square sets platted on the levels, up through the books by scaling, and testing with tracing paper, and then reproducing the sketches in the field books along those lines.

As a rule, all bends in the stopes conform to the bends on the levels, if not, they are platted as actually located in taking up the stopes. In the office books the chutes on all stope floors are colored black, and the numbers of the chutes are written adjoining. The lowest levels in all stope books are at the back of the books, and first floors of the levels next, and so on toward the front of the book for every level and stope above.

From what has been stated in regard to the construction of the office stope books, it can be readily understood that in case of a sudden demand for tracings of any or all workings, but a few days would be required in which to comply with the demand. This actually occurred less than two years since. A fire broke out in one of the mines and in order

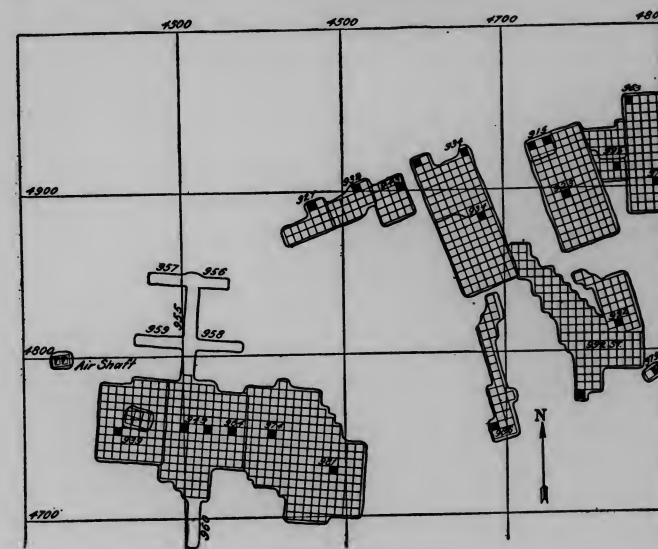


FIG. 241.

to stamp it out a large amount of extra mining was done. To do this and avoid breaking into old workings unexpectedly, it was necessary to make tracings, not only of several levels but of the stopes above the levels. With all the work correctly platted in the books, the tracings were ready for use within three days, whereas had the stopes not been platted as described, it would have required not less than a month and probably much longer. Then again, in the regular mining work it is often necessary to have special tracings, which will show any section of unworked ground, or the exact location of all stopes, or filling, cross-cuts, etc. The infor-

mation is always ready in the books for instant use, either by direct examination, or by tracings.

A clear idea of the entire stope-record system can be gained by an examination of the accompanying copy of a portion of a floor of one of the mines shown by Fig. 241.

In order to understand the progress measuring, a statement of the system of numbering used in the mines is necessary. All places such as cross-cuts, drifts, rises, winzes, chutes, and stopes are numbered in such a manner as at once to indicate the level on which they occur. For example all numbers on the first level are 100 to 199, A100 to A199, etc., all on the second level are 200 to 299, etc. So that all numbers for any level come within the hundred used in designating that level. On the 11th, and 21st, of each month all places run for development are measured, while upon the first of the month all openings including stopes are measured.

For the purpose of recording the progress of all shafts, cross-cuts, drifts raises, winzes, and stations, progress books are used which have these headings: Date, Vein, Place, Charge, Advance, Total, From, Height or Length, Width, Cubic Feet Ore, Cubic Feet Waste, Cars Ore, Cars Waste. The total distance mined in any particular place is recorded when measured in the column Total. The preceding measurement of that place is then subtracted from the total, and the remainder is recorded in the Advance column. Under the head Vein is written the name or number of the vein upon which any working is located, under place, is the number of the working, while under Charge, are the initials of the words showing for what purpose the work is being done. *M* is for mining, *D* is for development, *F* is for filling, *S S* is for shaft sinking. An account of the cost of mining all numbered places is kept by the clerical department of the company, and it is for that department the above letters are used. The purpose for which the work is run is determined by the foreman or superintendent. Under From is written the number of the opening from which any opening is measured. The other headings explain themselves. The cars of ore and waste are obtained from car-tally boss at the mines.

The record made in the field having been completed by calculations in the office determining the advance and cubic feet excavated, a report on progress sheets, 12 in. \times 17 in., is made out. The sheets for the monthly reports contain all the headings of the field books except, "Height or Length," Width, Cubic Feet, Total, and in addition have columns marked "Distance in Ore," "Width in Ore," "per cent. Copper," "Oz. Silver," Distance in Waste, Square Sets, Remarks.

During the progress of work in the mines a mine sampler takes samples of all veins. These samples are taken horizontally across the

vein, at right angles to it, and at regular intervals of from 5 to 10 ft. long. After these samples have been assayed, copies of the assayers reports are filed in the engineer's office. From these reports, all except stope assays are copied in assay books during the month. At the end of the month the recorded assays of any particular place are averaged, so that the progress in ore and waste, the width of the ore and the assay values are determined. These data are recorded on the sheets showing the monthly progress in the columns for that purpose. After these sheets have been carefully checked in every particular, they are used by the clerical department in making estimates of the cost of mining. They are then copied into bound progress books the same size as the sheets, there being a progress book for each mine. These books are constantly used for reference. The annual report of progress is made from these books, and contains a summary of everything therein recorded except assay value. These reports are copied in the annual progress books.

In order to preserve the knowledge of the exact location of all mine numbers, of which there are several thousand, and also as a partial index of the progress reports, the numbers are indexed in a set of books for that purpose. These books are 9 in. \times 11 in., one being used for each mine. Above the ruled columns are the printed headings, Number, Description, When Commenced, Place of Beginning, Ordinate *N*, Ordinate *E*, Remarks. The ordinates are scaled from the office stope books, and with other data, afford an accurate method of finding any number. These index books are brought up to date with the regular monthly work, all new numbers given out at the mine being located and recorded.

Of the office work thus far described, the most important, making reductions from the survey notes, copying field notes and office calculations, platting stopes, and copying monthly reports, is done by one person and checked by another. By this means all material errors are eliminated.

At the beginning of each year complete calculations of the ore reserves are made. Some of these calculations are made by applying the mine assays directly to particular portions of the veins as shown in the stope books, while a much larger number are made from maps showing longitudinal projections of the veins. The maps are 18 in. \times 24 in. and show the workings drawn to scale of 100 ft. to the inch.

The first map of any vein shows all workings on the vein from the surface to the sill of the twelfth level, while the second map will include all workings from the sill of the twelfth level to that of the twenty-sixth, level. These maps are cross-sectioned with lines 1 in. apart. The vertical lines are marked with the same numbers as the north and south coordinate lines in the books (stope), which include the veins projected. The horizontal lines are elevation lines and represent even hundreds of

feet above sea level. The planes of projection, except one which is north and south, are due east and west. All mine openings are projected by scaling east or west (except for north or south plane for which the scaling is north and south), from the nearest coordinates in the stope books to the ends of such openings, and then platting the distances thus obtained, on the projection sheets. The sill is first platted in this manner, using the calculated elevations to determine the vertical position on the sheet. Above the sill and parallel to it, are drawn pencil lines to represent the height of the stope floors, and the openings are then platted as stated. All new openings upon the vein are platted at the beginning of the year. The workings shown upon the projections are shaded with the same colors as the corresponding years in the stope books.

The veins are divided into convenient blocks, usually extending from one level to another, the blocks being bounded laterally by dotted red lines. The tons of ore in each block are obtained by scaling the height and length of the block from the map, multiplying the product of these two by the north and south width of the vein, and dividing the result by the estimated number of cubic feet of ore to the ton. The north and south width of the vein is obtained by calculation, from the average width of the vein given in the assay reports, and the course of the vein within the block. If the average width of the vein is found to be 10 ft. and its course is N. 35 degrees W., the width north and south will be 10 ft. divided by sine 35 degrees equals 17.4 ft. The course of the vein in the block is obtained by protractor from the drifts in the stope books, the general course of the vein being used. The contents in copper and silver in the blocks are obtained from the average mine assays of the drifts and raises inclosing the blocks. The extractions made during the year from any particular block are deducted from the total in the block by scaling from the projection maps, and making therefrom the necessary calculations of tons of ore, pounds of copper, and Oz. of silver.

Besides the annual determinations of the ore reserves, an estimate is made of the excess mined in the veins above the amount formerly calculated also a comparison between the cubic feet extracted from each mine and the total number of tons shipped, in order to determine the number of cubic feet of ore per ton in the mine.

Monthly and yearly records are kept in the department of the ore shipped from each mine, the per cent. copper, and ounces of silver and gold per ton, also the resulting pounds of copper, and ounces of gold and silver. The assay values of the ore are obtained from the sample cars which are regularly shipped to the smelter at Great Falls. These records are kept in books made to order for the purpose.

The above descriptions include the salient features of the methods of keeping engineering records used by this company. There are a

number of details which have necessarily arisen in connection with the elaboration of the work, which need not be mentioned.

All permanent records are kept in the most concise form possible, and are especially adapted to the work of a large company.

GEOLOGICAL DATA

METHODS OF RECORDING USED BY THE CALUMET AND ARIZONA MINING CO.

At the present time the output of the mines of the Calumet and Arizona company is about 1600 tons per day. A little over 50,000 ft. of development work is done each year. In order that a good geological record be kept of all these openings the company employs in their geological department three inspectors, whose duty it is to visit each of the openings often enough to make note of and have sampled the formations exposed before the openings are lagged or filled.

The chief engineer of the company has charge of the geological department. Those in this department do no surveying and no mapping beyond tracing maps made by the mine surveyors.

The mine notes are taken in ordinary transit and cross-section books, the former books being used for the development work and the cross-section books for the stopes. In the office these notes are transferred to cards and maps which are indexed and filed away.

The legend used is shown in Fig. 242. It will be seen from this that we have different symbols for, Schist, Quartzite, Limestone, Conglomerate, Rhyolite, Granite, Iron pyrite, Copper Oxide ore, Copper Sulphide ore, Leached material, Broken lime, and various kinds of altered lime. Copper Oxide ore is all material carrying 4 per cent. or more copper and less than 10 per cent. sulphur. Copper Sulphide ore is all material carrying 4 per cent. or more copper and 10 per cent. or more sulphur.

Legend


















| | | |
|---------------------------|---|-----------------|
| Schist |  | Green |
| Quartzite |  | Yellow |
| Lime |  | Blue |
| Conglomerate |  | Vermilion |
| Rhyolite |  | Green |
| Granite |  | Yellow |
| Pyrite (FeS_2) |  | Black |
| Oxide Ore |  | Crimson |
| Sulphide Ore |  | Crimson |
| Leached |  | Brown |
| Broken Lime |  | Blue |
| Altered Lime |  | Blue |
| Kalinalized Lime |  | Blue |
| Leached Lime |  | Blue And Brown |
| Pyritic Lime |  | Blue And Black |
| Siliceous Lime |  | Blue And Yellow |
| Lime Boulders |  | Blue |

FIG. 242.

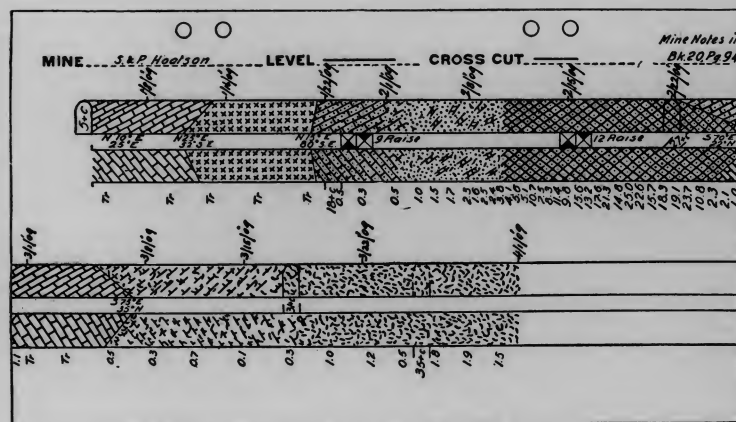


Fig. 243.

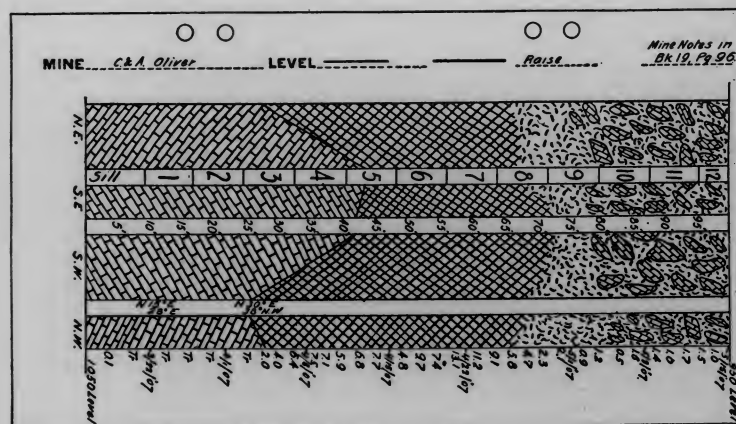


Fig. 244.

By combining the symbols we get all the gradations. For instance pyritic limestone is shown by combining the symbol of iron pyrite with the one of limestone and leached material. The legend shows all the rocks found in these mines. In the mine notes the symbols are shown in lead pencil, but in the office notes, colored inks are used to bring out the distinctions.

Field Notes.—In taking notes on the formation in the drifts, cross-cuts, and stations, the actual formation in the left wall and floor are

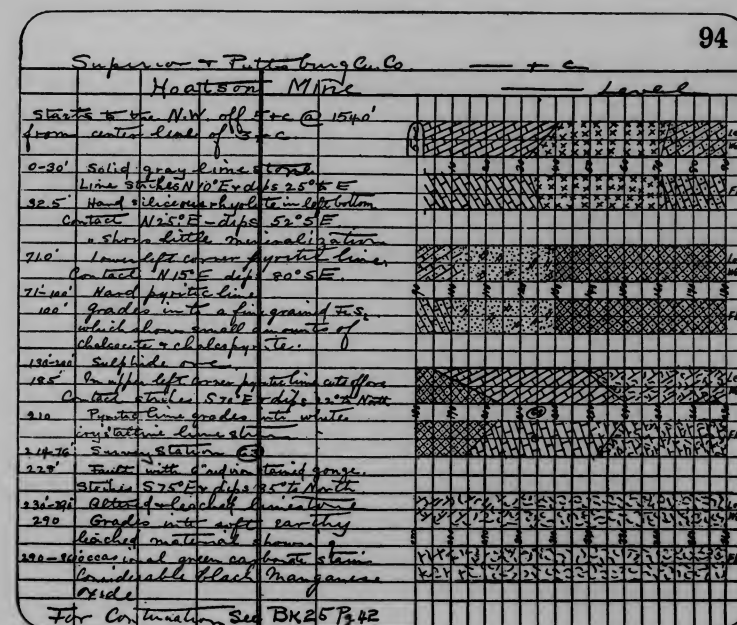


Fig. 245.

shown. The scale for the height or width of opening is not exact, but except for this the notes are drawn to scale as shown in Fig. 245.

On the left page of the transit book descriptive notes are written. The character of the material cut, contacts, faults, etc., are given; also the distance to the survey station used in measuring to contacts, etc. Anything else that will tend to make the record clear and complete is written down. The formation on the left wall and floor are shown diagrammatically on the right page.

In a similar manner the notes for raises, winzes, and shafts are taken,

the only difference being that instead of having but two walls shown, all four are sketched as shown in Fig. 246. These sketches are drawn to scale except for the width and length which are only approximate. The timber sets are shown on the sketch. The height of the sill set is 8 ft. 10 in. and the height of the other sets, 7 ft. 10 in. center to center.

As for the stope sketches, since nearly all the ground is mined by the square set system, the field notes show the sets taken out and the formation on each floor as shown in Fig. 247.

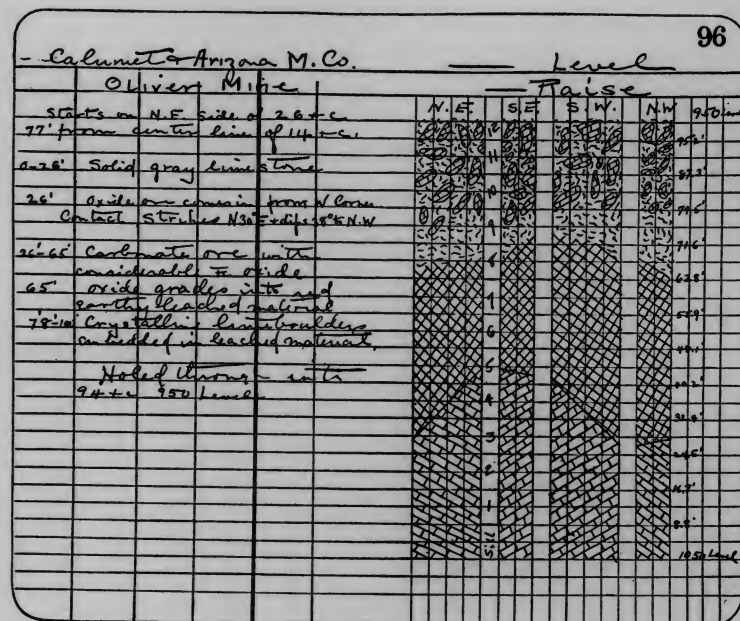


Fig. 246.

Each floor is plotted on a separate page. It is seldom that any other method of stoping is used, but when one is, points are established by the mine surveyors and these are used by the inspectors to make horizontal sections through the stope, at the intervals where the floors would come, were the square set method used.

Office Records.—In the office the mine notes are transferred to cards which are 5 in. \times 9 in. and are cross-sectioned to inches and tenths of inches. The drifts, cross-cuts, stations, and stopes are plotted to a scale of 1 in. equals 25 ft. The shafts, raises, winzes are plotted to a

scale of 1 in. equals 12.5 ft. As in the mine notes the height and width of drifts, cross-cuts, and stations and the length and width of raises, winzes, and shafts are not plotted exactly to scale. The finished card

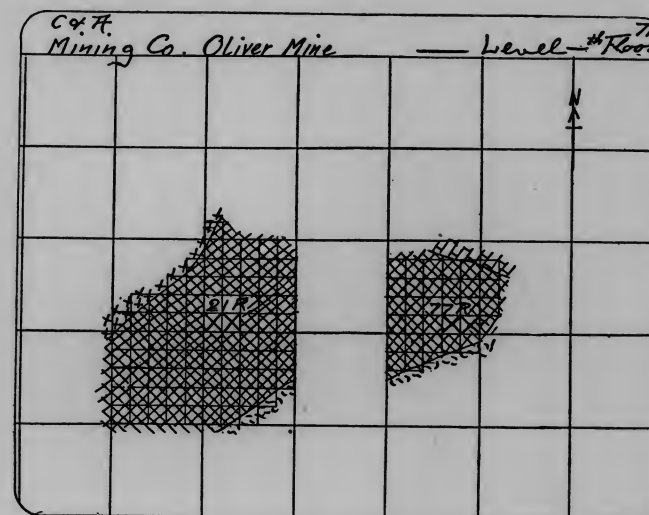


Fig. 247.

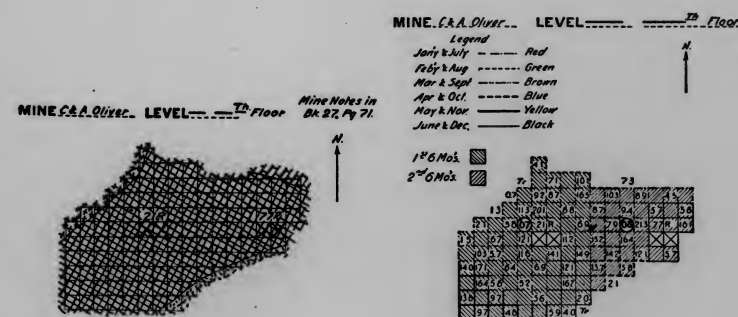


Fig. 248.

Fig. 249.

notes made from the mine notes, Figs. 245 and 246, are shown in Figs. 243 and 244 respectively. Except for the descriptive notes these cards show everything the field notes show. In addition to this, the cards

for the development work show by the dates the position of the breast, back, or bottom, as the case may be, on the 1st, 8th, 15th, and 22nd, of each month, provided that the opening has advanced during the preceding interval. They also show the field book and page from which

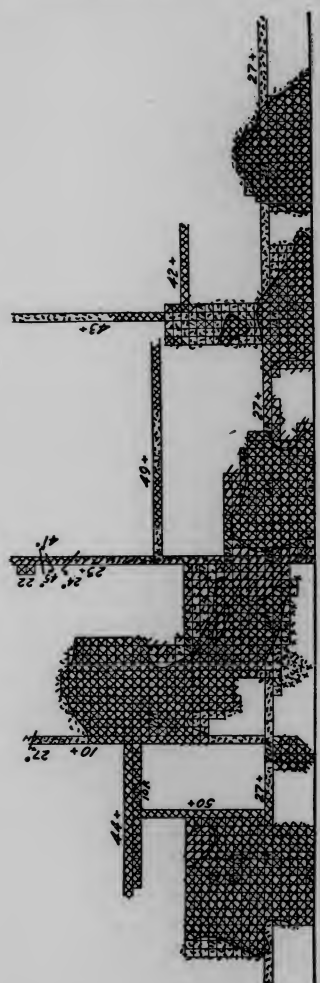
the card was made, all development work started from it, and also in red ink the assays for copper contained.

As for the office record of the stopes, see Figs. 248 and 249. Fig. 248 shows the sets removed and the formation. As there is not sufficient space on this card to show clearly the copper contents and the time of removal, a piece of tracing cloth is cut to fit over the stope card. On this the sets are drawn in colored inks and the percentage of copper is written in black ink at the places where the samples were taken, as shown in Fig. 249. The colored inks with the cross-sectioning show the month of the year that the ground was stoped. The year of removal is shown in black ink with a circle around it.

Formation Maps.—In order that the formation in each opening be shown in its relation to other openings, large maps, 53 in. \times 32 in. are drawn on tracing cloth to a scale of 1 in. equals 50 ft. There is a map made for each floor in the mine. On this, the formation is plotted from the cards as seen in Fig. 250, showing a portion of such a map.

These maps are made on tracing cloth so that they may be traced from the maps of the mine

surveyors, and also that they may be placed on top of each other so that the relations of the formation on the different elevations can be



readily seen. Vertical cross-sections are made on tracing cloth wherever there is sufficient data to make them of use, these are made from the large 50 ft. to the 1 in. formation maps.

Estimates of ore reserves are made about once each year, for which the formation maps, together with the vertical sections are used.

INDEX

- Accident reports, 134
- Abstract, bills collectable, 215
 - voucher, 215
- Account, cash, 61, 68
 - closed, 214
 - company general, 3
 - company operating, 3
 - company team, 88
 - depreciation, 209
 - expense, 269
 - general plant, depreciation of, 208
 - gold, 279
 - mine, general, 3, 5
 - mine, profit and loss, 5
 - miscellaneous, profit and loss, 13
 - plant, 283
 - profit and loss, 5
 - stable, 287
 - treasurer's, 68
 - Victor Mill, 297
 - wash, 95
- Accounts, closed, 75, 174
 - closed mill, 93
 - construction, 95
 - deferred, 95
 - development, 97
 - distributed mine, 288
 - distributing, 28
 - expense, 169
 - general ledger, 64
 - head office ledger, 58, 60, 277
 - inventory, 16
 - ledger, general office, 205, 206
 - Wasatch Store Co., 269
 - mine, 63, 282
 - open pit mines, 35
 - underground mines, 26
 - mining expense, open pit mines, 36
 - underground mines, 32
 - new construction, 9
 - operating, 150, 169
 - receivable, 6, 61, 74, 278, 283
 - shop, 74
 - sub-mine, 95, 285
 - supply, 16
 - surface expense, 33
- Accounting, general ledger, 3
 - general, mine books, 107
 - general office and mine, 6, 214
 - general statement of, 180, 297
 - general, sub-ledger, 5
 - methods, Oliver Iron Mining Co., 1
 - Calumet & Arizona Mining Co., 168
 - Ojibway Mining Co., 58
 - Portland Gold Mining Co., 275
 - Utah Con. Mining Co., 148
 - Utah Fuel Co., 203
 - Wasatch Store Co., 269
 - mine office, 235
- Additional expenditures, details of, 235
- Administrative expense, 28
- Advertising, 9
- Agencies and commissions, outside, 9
- Agent, mine, 61
- Aid fund, 70
 - rules, 70
- Air lines, 82
- Ammunition order, 294
- Analysis, 9
- Animal reports, 255
- Animals, depreciation of, 210
 - killed and sold, 209, 223, 255
- Application for dwelling, 89
- Applying for situation, 183
- Assaying and sampling, 295
- Assessments, 60
- Assets, 62
- Attendance, medical, 72
- Audited bills, 69
- Auxiliary hoists, 289
 - records, 210-213
- Balance sheet, 234, 273, 281
- Bills audited, 69
 - collectable, 251
 - abstract of, 215
 - ledger, 215
- Blacksmiths, 75
- Blacksmith shop, 288
 - expense, 180
- Blasting, drilling and, 37, 38
 - report, 154, 157

- Boarding-house expenditures, 208
 - fixtures, 206
 - receipts, 208
 - receipts and expenditures, 252
 - record of meals served, 251
 - reports, 223
- Boilers, 151
- Boiler-house expense, 174
 - room, 288
 - record, 174
- Books, calculation, 326
 - field, surveying, 325
 - office stope, 327
 - progress, 332
 - and stationery, coupons, 270
- Boston & Montans Con. Copper & Silver Mining Co., 325
 - books, calculation, 326
 - office stope, 327
 - progress, 332
 - surveying field, 325
 - calculation books, 326
 - of ore reserves, 333
 - calculations, survey, 326
 - engineering data, methods of recording, 325
 - field books, surveying, 325
 - notes, recording, 325
 - maps, surface, 328
 - underground, 328
 - mine openings, system of numbering, 329, 332
 - numbering mine openings, system of, 329, 332
 - office records, survey, 327
 - office stope books, 327
 - openings, system of numbering mine, 329, 332
 - ore reserves, calculation of, 333
 - platting surveys, 328
 - progress books, 332
 - report, 332
 - recording field notes, 326
 - records, survey office, 327
 - report, progress, 332
 - sketches, underground, 330
 - stope books, office, 327
 - survey calculations, 326
 - office records, 327
 - surveying field books, 325
 - surveys, platting, 328
 - underground sketches, 330
- Breaking and crushing ore, 34
 - ore, 285
- Briquetting press expense, 177
- Buildings, 206, 269, 286
 - and chutes, repairs to, 212
 - and fixtures, 151
 - repairs to, 178, 214
 - saloon, 207
- Bullion, loading expense, 177
- Burning and drawing, 213
- Cage and skip tenders, 33
- Calculation books, 326
 - of ore reserves, 333
- Calculations, survey, 326
- Calumet & Arizona Mining Co., smelter, 168
 - accounting methods, 168
 - accounting, general statement, 180
 - accounts, closed, 174
 - expense, 169
 - operating, 169
 - applying for situation, 183
 - blacksmith shop expense, 180
 - boiler-room expense, 174
 - record, 174
 - briquetting press expense, 177
 - buildings, repair of, 178
 - bullion, loading expense, 177
 - carpenter-shop expense, 180
 - closed accounts, 174
 - coke, delivering expense, ore and, 177
 - converter expense, 170
 - copper ore, smelting, 168
 - cost sheets, 190
 - crane expense, 178
 - distribution of labor, 186
 - dwelling, report of, 178
 - electric plant expense, 178
 - power record, 178
 - electric shop expense, 180
 - engaging labor, 182
 - engineering expense, 179
 - engineering data, 317
 - geological data, 335
 - expense accounts, 169
 - bills, freight, 182
 - blacksmith shop, 180
 - boiler house, 174
 - briquetting press, 177
 - carpenter shop, 180
 - converter, 170

- Calumet & Arizona Mining Co. (Cont'd)
 - crane, 178
 - delivering ore and coke, 177
 - electric plant, 178
 - electrical shop, 180
 - engineering, 179
 - furnace, 170
 - general, 169
 - hauling slag, 178
 - laboratory, 174
 - lighting, 178
 - loading bullion, 177
 - machine shop, 180
 - mud mill, 177
 - office, 169
 - ore sampling, 179
 - power house, 177
 - pumping, 177
 - warehouse, 178
- freight expense bills, 182
- fuel oil tests, 176
- furnace expense, 170
 - report, daily, 173
 - monthly, 173
- gas analysis report, 174
- general expense, 169
- invoices, 180
- labor, distribution of, 186
 - engaging, 182
 - reference, investigation of, 183
- laboratory expense, 174
- lighting expense, 178
- machine shop expense, 180
- methods of recording engineering data, 317
 - composite maps, 324
 - elevation card, 319
 - engineering data, 317
 - recording, forms used for, 317
 - forms used for recording engineering data, 317
 - maps, composite, 324
 - stope, 324
 - measurement card, 319
 - total card, 322
- mine openings, system of numbering, 317
 - numbering mine openings, system of, 317
- Raise & Winze card, 321
- recording engineering data, forms used for, 317
- Calumet & Arizona Mining Co. (Cont'd)
 - sketch card, 319
 - stope card, 321
 - maps, 324
 - total card, 323
 - survey cards, 318
 - system of numbering mine openings, 317
 - tracings, 324
 - Winze card, Raise &, 321
 - methods of recording geological data, 335
 - field notes, 337
 - formation maps, 340
 - geological data, 335
 - legend, 335
 - maps, formation, 340
 - mine notes, 335
 - notes, field, 337
 - mine, 335
 - office records, 338
 - records, office, 338
 - moistures, ore, 188
 - mud mill expense, 177
 - office expense, 169
 - operating accounts, 169
 - ore moistures, 188
 - ore shipments received, 188
 - ore in stock, 190
 - unloading, 179
 - payrolls, 186
 - power-house expense, 177
 - production statement, 190
 - pumping expense, 177
 - record, boiler-room, 174
 - electric power, 178
 - water treatment, 174
 - voucher, 180
 - reference, labor investigation, 183
 - refinery results, 190
 - repair of buildings, 178
 - dwelling, 178
 - report, furnace, daily, 173
 - monthly, 173
 - gas analysis, 174
 - smelter, 173
 - results, refinery, 190
 - sampling expense, ore, 179
 - shipments of ore received, 188
 - situation, applying for, 183
 - slag, hauling expense, 178
 - smelter report, daily, 173

- Calumet & Arizona Mining Co. (Cont'd)
 smelting copper ore, 168
 stock, ore in, 190
 supplies, 181
 tests, fuel oil, 176
 timebooks, 184
 unloading ore, 179
 voucher record, 180
 warehouse expense, 178
 water treatment record, 174
 Capital stock, 58, 278
 Captains, mining, 33, 37, 38
 Carpenters, 74
 Carpenter-shop expense, 180
 and surface, 288
 Cars and rails, 287
 Cars, repairs to, 211
 repairs, locomotives and, 37
 and tracks, 151, 206
 underground, 83
 Cash, 278, 283
 account, 61, 68
 book, 107, 214, 268, 297
 Cement, etc., 105
 Change house, dry and, 33
 Charging ovens, 213
 Check register, 108
 roll, 44
 Checks, pay, 116
 Chemistry, surveying and, 34, 39
 Chutes, repairs to buildings and, 212
 and trestles, tramways, 206
 Cinders, loading, 214
 Claims, 131
 personal injury, 208
 Classification, labor, 46
 surface labor, 113, 117
 underground labor, 113, 117
 Clearing land, 89
 Clerks, superintendence and, 212, 213
 Closed account, 214
 accounts, 75, 174
 mill, 93
 Coal, Blossburg, 106
 and coke mined and shipped, 207
 cost to consumers, 204
 expense, sub-accounts, 210
 hard, 106
 mined and distribution, report of, 268
 mined, record of, 238
 mining, and making coke, 203
 sales ledger, 215
- Calumet & Arizona Mining Co. (Cont'd)
 soft, 106
 used, 213
 Coke, 106
 cost of, to consumers, 204
 delivering expense, ore and, 177
 expense, 207
 sub-accounts, 213
 experiments, 214
 loading, 213
 making, and mining coal, 203
 mined and shipped, coal and, 267
 operations, record of, 267
 ovens, 206
 cost sheet, 224
 repairs to, 214
 Collectable, bills, 251
 Commission, outside agencies and, 9
 Companies and individuals, 210, 272
 subsidiaries of Utah Fuel Co., 203
 Company, general account, 3
 expense, 7
 operating account, 3
 team account, 88
 Comparative cost statement, 134
 statement of operations, 230
 Composite maps, 324
 Compressing, 288
 Compressor, 79, 151
 and air drills, 31
 report, 79
 Construction, 61, 64
 accounts, 95
 new, 9
 schedule for, 10, 95
 new, 5
 supplies charged to, 130
 Consumed, supplies, 17
 Contract book, 44
 curves, 154
 stripping, 38
 Contributions, 34, 39
 Converter expense, 170
 Conveyor, 94
 Copper, 61
 cost of, to consumers, 59
 mining and milling native, 58
 ore, mining, 149
 smelting, 168
 Corrections, journal of, 268
 Cost of coal to consumers, 204
 coke to consumers, 204

- Cost of copper to consumers, 59
 gold at the mint, 276
 iron ore at the furnace, 4
 ore at the mines, 6
 upper ports, 6
 lower ports, 6
 property, 206
 sheet, coke ovens, 224
 general, 6, 313
 mine, 6, 230
 sheets, 134, 190
 statement, comparative, 134
 Coupon report, 272
 Coupons, books and stationery, 270
 outstanding, 272
 Crane expense, 178
 Crushing ore, breaking and, 34
 Cross-cuts, 286
 Current liabilities, 274
 Curves, contract, 154
 payday, 157
 Dead work, 212
 Deductions, payroll, 223, 242
 Deferred Accounts, 74
 charges, 5, 15
 Deficiency, payroll, 209
 Depreciation, 15, 222, 272
 account, 209
 of animals, 210
 of general plant account, 208
 Details of general expense, 222
 Development, 64, 150, 283
 accounts, 97
 schedule for, 130
 mine, 206
 in ore, 32
 in rock, 32
 report, 134
 sheets, stope and, 313
 stripping and, 37
 supplies charged to, 130
 Diamond drilling records, 98
 Direct expense, general office, 7
 mine expense, 7
 Disbursements, 21
 receipts and, 21, 281
 Discount and exchange, interest, 209
 interest and, 62
 Distributed mine accounts, 288
 Distributing Accounts, 28
 Distribution of coal mined, report of, 268
- Distribution of coke oven payrolls, 247, 248
 labor, 186, 238, 300
 mine payrolls, 244, 248
 power drills, 80
 District expense, 7
 Districts, iron mining, 1
 Dividends, 279
 unclaimed, 280
 Drainage tunnel, 279
 and watering mine, 211
 Drawing, burning and, 213
 Drifts, 286
 Drill machine report, 161
 record, power, 81
 Drills, compressor and air, 31
 distribution of power, 80
 machine, 288
 power, 79
 sharpening report, 80
 Drilling and blasting, 37, 38
 records, diamond, 98
 report, 163
 Driving entry, 211
 Dry and change houses, 33
 Dwellings, application for, 89
 lease, 89
 repairs to, 178
 Earnings, 207, 269
 estimated tonnage and, 268
 tonnage and, 224
 Electric lights, 151, 211
 light and power, 76, 94
 plant, 290
 expense, 178
 report, 76
 power, 28
 record, 178
 shop expense, 180
 supplies, 106
 Electricians, 75
 Elevation cards, 319
 Elevators, screens, and, 94
 Engaging labor, 111, 182, 297
 Engineering, 212-213
 department, 75
 and laboratory, 151
 expense, 179
 property, 209
 data, methods of recording, 317, 325
 recording, forms used for, 317

- Engineer's logs, 28
- Entertainment, traveling and, 9
- Entries, journal, 107
- Entry driving, 211
- Equipment, permanent, 279
 - rental of, 131
 - transfer of supplies and, 221
- Exchange, interest, discount and, 209
- Expenditures, 63
 - boarding house, 208
 - receipts and, 252
 - general, 64
- Expense account, 269
 - accounts, 169
 - mine, 6
 - mining, open pit mines, 36
 - bills, freight, 182
 - blacksmith-shop, 180
 - boiler-house, 174
 - briquetting press, 177
 - coal, sub-accounts, 210
 - coke, 207
 - carpenter shop, 180
 - company general, 7
 - converter, 170
 - crane, 178
 - delivering ore and coke, 177
 - direct mine, 7
 - district, 7
 - electrical shop, 180
 - electric plant, 178
 - engineering, 179
 - furnace, 170
 - general, 7, 61, 95, 151, 169, 207, 208, 213, 280, 296
 - mining, 39
 - office, direct, 7
 - stripping, 38
 - surface, 34,
 - underground, 33, 85
 - hauling slag, 178
 - hoisting, 33
 - laboratory, 174
 - law, 207
 - legal, 8, 62, 280
 - lighting, 178
 - loading bullion, 177
 - machine shop, 180
 - mine, 207
 - mining, 38, 65, 98, 210, 279
 - mud mill, 177
 - office, 8, 34, 37, 39, 61, 68, 169, 280, 296
- Expense, operating, 6, 61
 - ore sampling, 179
 - other, 286
 - power house, 177
 - pumping, 177
 - stamping, 102
 - stock pile, 39
 - surface, 68, 151
 - track, 37, 38
 - warehouse, 178
 - waste pile, 37
 - winter, 36
- Expenses, administrative, 28
 - details of general, 222
 - extraordinary, 216
 - general office, salaries and, 207
 - shop, 31
 - special, 9
- Experiments, coke, 214
- Experimental work, 9
- Exploring, 150
- Exploration, mine, 33
- Explosives, 105, 152, 287, 294
- Extraordinary expense, 216
- Field books, surveying, 325
 - notes, 337
 - notes, recording, 325
- Financial statement, 62, 230, 273, 280
- Firing cold ovens, 214
- Fittings, pipe and, 105
- Fixtures, boarding house, 206
 - buildings and, 151
 - furniture and, 60, 279
 - office, 287
 - furniture and, 8
- Forage report, 256
- Formation maps, 340
- Forms used for recording engineering data, 317
- Freight, 286
 - expense bills, 182
 - received record, 124
- Fuel, 74, 152, 287, 294
 - oil tests, 176
 - stamp mill, 106
- Fund, aid, 70
 - personal injury, 209
 - special renewal, 209
- Furnace expense, 170
 - reports, 173

- Furniture and fixtures, 60, 279
 - office, 8
- Gas analysis report, 174
- General, 62
 - accounting, mine books, 107
 - cost sheet, 6
 - expenditures, 64
 - expense, 7, 61, 95, 151, 169, 207, 208, 213, 280, 296
 - company, 7
 - expenses, details of, 222
 - mining expense, 39
 - office, 152
 - accounting, 215
 - direct expense, 7
 - and mining accounting, 6
 - salaries and expenses, 207
 - repairs, 38
 - supplies, 105
 - surface expense, 34
 - underground expense, 33
- Geological data, methods of recording, 335
- Gold account, 279
 - cost of at the mint, 276
 - ore, mining and milling, 275
- Grading highways, 34
- Graphic records, 153
- Grease, oils and, 106
- Hand, loading stockpile by, 33
 - mining by, 38
 - stripping by, 37
 - tramping by, 32
- Haulage system, waste, 291
- Hauling, 210
- Head office, ledger accounts, 58, 60, 277
- Headworks, 287
- Heating, 151
 - system, 88
- Highways, 89
 - grading, 34
- Hoist report, 290
- Hoists, auxiliary, 289
- Hoisted, monthly record of rock, 86
 - summary of rock, 88
- Hoisting, 85, 151, 285, 290
 - expense, 33
 - record, 86
 - records, summary of, 88
 - ropes, 106
- Hospital, 285
- Houses, ore, 291
- Improvements, 12, 219
- Incidentals, 68, 213, 214
- Income account, 231, 234, 273
- Individuals and companies, 210, 272
- Injuries, personal, 34, 39
- Injury claims, personal, 208
 - fund, personal, 209
- Insurance, 13, 69, 208, 272, 280, 283
 - marine, 14
- Interest and discount, 62
 - discount and exchange, 209
- Inventory accounts, 16
- Invoices, 39, 125, 180, 216, 250, 307
- Iron mines, 1
 - and steel, 105
 - mining districts, 1
 - ranges, 1
 - ore, cost of at the furnace, 4
 - mining, 1
- Jigs, 94
- Job orders, 118
 - records, 119
- Journal, 107, 215, 268
 - of corrections, 268
 - entries, 107
 - miscellaneous, 41
- Labor charges, etc., transfer of supplies, 24
 - chart, tonnage and, 152
 - classification, 46
 - surface, 113, 117
 - underground, 113, 117
 - distribution of, 186, 238, 300
 - engaging, 111, 182, 297
 - reference, investigation of, 183
 - report, 164
 - sheets, 57, 69
- Laboratory, 31, 95
 - and engineering department, 151
 - expense, 174
- Land, clearing, 89
 - lease, 89
- Lands, 206
- Law expense, 207
- Lease, dwelling, 89
 - land, 89

- Ledger, 42, 215, 268
 - accounts, general, 64
 - Wasatch Store Co., 269
 - accounting, 3
 - sub-general, 5
 - Bills collectable, 215
 - coal sales, 215
 - ore, 43
 - atockpile, 44
- Ledgers, 107
- Legal expense, 8, 62, 280
- Legend, 335
- Liabilities, 62
 - current, 274
- Light and power, electric, 76, 94
- Lighting, 37, 38, 295
 - expense, 178
- Lights, electric, 151
- Litigation, 280
- Leading, 211
 - cinders, 214
 - coke, 212
 - stock-pile, steam shovel, 33
 - hand, 33
- Locomotives and cars, repairs to, 37, 38
 - operating, 37, 38
- Logs, engineers, 28
- Loss and gain, 61, 278
 - on supplies, adjustment, 106
- Lower ports, cost of ore at, 6
 - ore at, 5, 18
- Lumber and timber, 105, 152, 287, 294
- Machine drills, 288
 - report, 164
 - report, 161
 - shop, 288
 - expense, 180
- Machinery, 105, 151, 287
 - power and, 206
 - for prospecting, 207
 - rentals, 25
 - repairs to, 212
- Machinists, 74
- Machineman's report, 288
- Manufactured supplies, 17
- Manufacturing supplies, 106
- Maps, composite, 324
 - formation, 340
 - stope, 324
 - surface, 328
 - underground, 328
- Marine insurance, 14
- Masons, 75
- Material received register, 307
- Meals served, record of, 251
- Measurement card, 319
 - total card, 322
- Medical attendance, 72
- Merchandise bought, 269
 - sales, 269
- Mill, Portland, 279-286
 - report, 103
 - saw, 210
 - Victor, 279
- Milling, 283
 - gold ore, mining and, 275
 - native copper, mining and, 58
- Mine accounts, 63, 282
 - distributed accounts, 288
 - expense accounts, 6
 - open pit mines, 35
 - underground mines, 26
 - sub-accounts, 285
 - agent, 61
 - cost sheet, 6, 230
 - development, 206
 - expense, 207
 - district, 7
 - explorations, 33
 - notes, 335
 - office, 105
 - accounting, 39, 235
 - openings, system of numbering, 317, 329, 332
 - operations, record of, 267
 - report, 133, 164
 - profit and loss account, 5
- Mined coal and coke, shipped and, 267
- Mines, coal, 203
 - cost of ore at, 6
 - iron, 1
 - ore at, 5, 18
 - reports received from, 222
- Mining captains, 33, 37, 38
 - coal and making coke, 203
 - copper ore, 149
 - districts, iron, 1
 - expense, 38, 65, 98, 210, 279
 - accounts, open pit mines, 36
 - underground mines, 32
 - general, 39
 - hand, 38
 - iron ore, 1

- Mining and milling gold ore, 275
 - native copper, 58
 - property, 60
 - ranges, iron, 1
 - supplies, 16
 - and surface, vouchers charged to, 43
- Mineral and mass copper shipped,
 - reports, 67
 - reports, 103
- Miscellaneous, 34, 280
 - journal entries, 41
 - profit and loss, 13
- Moistures, ore, 188
- Mud mill expense, 177
- Nationality report, 134, 256
- New construction, 5
 - tramway, 151
- Notes, field, 337
 - mine, 335
 - receivable, 61
- Numbering mine openings, system of,
 - 317, 329, 332
- Office accounting, general, 215
 - expense, 8, 34, 37, 39, 61, 68, 169, 280, 296
 - fixtures, 287
 - furniture and fixtures, 8
 - general, 152
 - ledger accounts, 205, 206
 - reports made at, 223
 - mine, 105
 - orders, 123
 - purchasing agent, 105
 - records, 338
 - survey, 327
 - reports to general, 47
 - stope books, 327
- Officers' salaries, 280
- Oils and grease, 106
- Ojibway Mining Co., methods of account-
 - ing, 58
 - accident reports, 134
 - account, cash, 61, 68
 - company team, 88
 - treasurer's, 68
 - wash, 95
 - accounts, closed, 75
 - mill, 93
 - construction, 95
 - deferred, 74
- Ojibway Mining Co. (Cont'd)
 - development, 97
 - general ledger, 64
 - head office, ledger, 58-60
 - mine, mine books, 63
 - receivable, 61, 74
 - shop, 74
 - sub, 95
 - accounting, general, mine books, 107
 - agent, mine, 61
 - aid fund, 70
 - rules, 70
 - air lines, 82
 - application for dwelling, 89
 - assessments, 60
 - assets, 62
 - attendance, medical, 72
 - audited bills, 69
 - bills audited, 69
 - blacksmiths, 75
 - capital stock, 58
 - carpenters, 74
 - cars, underground, 83
 - cash account, 61, 68
 - book, 107
 - cement, etc, 105
 - check register, 108
 - checks, pay, 162
 - claims, 131
 - classification, underground, labor,
 - 113, 117
 - surface labor, 113, 117
 - clearing land, 89
 - closed accounts, 75
 - mill, 93
 - coal, Blossburg, 106
 - hard, 106
 - soft, 106
 - coke, 106
 - company team account, 88
 - comparative cost statement, 134
 - compressor, 79
 - report, 79
 - construction, 61, 64
 - accounts, 95
 - schedule for, 95
 - supplies charged to, 130
 - conveyor, 94
 - copper, 61
 - cost of to consumers, 59
 - mining and milling native, 58
 - cost of copper to consumers, 59

Ojibway Mining Co. (Cont'd)
 cost sheets, 134
 statement, comparative, 134
 deferred accounts, 74
 development, 64
 accounts, 97
 schedule for, 130
 report, 134
 supplies charged to operation
 and, 130
 diamond drilling records, 98
 discount, interest and, 62
 distribution of power drills, 60
 drill record, power, 81
 sharpening report, 80
 drills, distribution of power, 80
 power, 79
 drilling records, diamond, 98
 dwelling, application for, 89
 lease, 89
 electricians, 75
 electric light and power, 76, 94
 plant report, 76
 supplies, 106
 elevators, screens and, 94
 engaging labor, 111
 engineering department, 75
 entries, journal, 107
 equipment, rental of, 131
 expenditures, 63
 general, 64
 expense, general, 61, 95
 underground, 85
 legal, 62
 mining, 65, 98
 office, 61, 68
 operating, 61
 stamping, 102
 surface, 68
 explosives, 105
 financial statement, 62
 fittings, pipe and, 105
 fixtures, furniture and, 60
 freight received record, 124
 fuel, 74
 stamp mill, 106
 fund, aid, 70
 furniture and fixtures, 60
 general, 62
 accounting, mine books, 107
 expenditures, 64
 expense, 61, 95
 supplies, 105

Ojibway Mining Co. (Cont'd)
 grease, oils and, 106
 head office, ledger accounts, 58-60
 heating system, 88
 highways, 89
 hoisted, monthly record of rock, 86
 summary of rock, 88
 hoisting, 85
 record, daily, 86
 records, summary of, 88
 ropes, 106
 incidentals, 68
 insurance, 69
 interest and discount, 62
 invoices, 125
 iron and steel, 105
 jigs, 94
 job orders, 118
 records, 119
 journal, 107
 entries, 107
 labor, engaging, 111
 classification, underground, 113,
 117
 surface, 113, 117
 sundry, 69
 laboratory, 95
 land, clearing, 89
 lease, 89
 lease, dwelling, 89
 land, 89
 ledger accounts, general, 64
 ledgers, 107
 legal expense, 62
 liabilities, 62
 light and power, electric, 76, 94
 loss and gain, 61
 on supplies, adjustment, 106
 lumber and timber, 105
 machinery, 105
 machinists, 74
 manufacturing supplies, 106
 masons, 75
 medical attendance, 72
 mill report, daily, 103
 milling native copper, mining and, 58
 mine accounts, mine books, 63
 agent, 61
 office, 105
 report, daily, 133
 mining expense, 65, 98
 and milling native copper, 58
 property, 60

Ojibway Mining Co. (Cont'd)
 mineral and mass copper shipped,
 reports, 67, 103
 nationality report, 134
 notes receivable, 61
 office expense, 61, 68
 mine, 105
 orders, 123
 purchasing agent, 105
 oils and grease, 106
 operating accounts, schedule for, 130
 operations and development, sup-
 plies charged to, 130
 orders, job, 118
 office, 123
 purchase, 123
 pay checks, 116
 pay roll, 115
 payable, vouchers, 58
 pedigree records, 111
 pipe and fittings, 105
 plant, steam, 75, 93
 postage and stationery, 62
 power, electric light and, 76, 94
 drills, 79
 property, mining, 60
 pumping, 85, 94
 purchase orders, 123
 of supplies, 121
 purchasing agent, office of, 105
 receipts, 62
 receivable accounts, 61, 74
 notes, 61
 record, freight received, 124
 hoisting, daily, 86
 power drill, 81
 rock hoisted, monthly, 86
 supplies used, 127
 tramming, monthly, 83
 voucher, 108
 records, diamond drilling, 98
 job, 119
 pedigree, 111
 rent, 93
 stock, 126
 summary of hoisting, 88
 register, check, 108
 regrinding, 94
 rent records, 93
 rents, 89, 95
 rental of equipment, 131
 report, compressor, 79
 development, 134

Ojibway Mining Co. (Cont'd)
 distribution of power drills, 80
 drills sharpened, 80
 electric plant, 76
 mill, daily, 103
 mine, daily, 133
 mineral, daily, 103
 nationality, 134
 rock trammed, 83
 shipped, 66
 steam plant, 75
 supply, daily, 103
 trammer bosses', 82
 reports, accident, 134
 mineral and mass copper shipped,
 67
 rock shipped, train, 66
 requisitions, supply, 123
 rock hoisted, monthly record, 86
 summary of, 88
 rock house, 88
 shipped, train reports, 66
 trammed report, 83
 rolls, 94
 ropes, hoisting, 106
 rules, aid fund, 70
 salaries, 62
 schedule for construction accounts,
 95
 development accounts, 130
 operation accounts, 130
 screens and elevators, 94
 selling, smelting and, 62
 settlements, 112
 shop accounts, 74
 smelting and selling, 62
 stamping, 68, 102
 stamp mill, closed accounts, 93
 fuel, 106
 supplies, 106
 statement, financial, 62
 stationery, postage and, 62
 steam plant, 75, 93
 report, 75
 steel, iron and, 105
 stock, capital, 58
 records, 126
 stoping, 98
 sub-accounts, 95
 subscription, 60
 sundry labor, 69
 supply report, daily, 103
 requisitions, 123

- Ojibway Mining Co. (Cont'd)
- supplies, 74
 - charged to construction, 130
 - operation and development, 130
 - electric, 106
 - general, 105
 - loss and gain on, adjustment, 106
 - manufacturing, 106
 - purchase of, 121
 - stamp mill, 106
 - used, record of, 127
 - surface expense, 68
 - tables and vanners, 94
 - taxes, 69
 - team account, company, 88
 - teaming, 74
 - timber, lumber and, 105
 - timbering, 83
 - timebooks and timekeeping, 112
 - Tools, 106
 - tracks, underground, 83
 - train reports, rock shipped, 66
 - trammer bosses report, 82
 - trammed, report of rock, 83
 - trammings, 82
 - monthly record of, 83
 - transportation, 65
 - treasurer's account, 68
 - trial balance, 62
 - underground cars, 83
 - expense, general, 85
 - tracks, 83
 - vanners, tables and, 94
 - voucher record, 108
 - vouchers, 111
 - payable, 58
 - wash account, 95
 - water supply, 88
 - wood, boiler, 106
 - family, 106
- Oliver Iron Mining Co., methods of
- accounting, 1
 - account, company, general, 3
 - operating, 3
 - mine, general, 3, 5
 - profit and loss, 5
 - miscellaneous profit and loss, 13
 - profit and loss, 5
 - accounts, distributing, 28
 - inventory, 16
 - mine books, underground mines, 26
 - open pit mines, 35
- Oliver Iron Mining Co. (Cont'd)
- mining expense, open pit mines, 36
 - underground mines, 32
 - new construction, 9
 - receivable, 6
 - supply, 16
 - surface expense, 33
 - accounting, general ledger, 3
 - general office and mine, 6
 - sub-ledger, 5
 - administrative expense, 28
 - advertising, 9
 - agencies and commissions, outside, 9
 - analysis, 9
 - blasting, drilling and, 37, 38
 - breaking and crushing ore, 34
 - cage and skip tenders, 33
 - captains, mining, 33, 37, 38
 - cars, repairing locomotives and, 37
 - change houses, dry and, 33
 - check roll, 44
 - chemistry, surveying, and, 34, 39
 - classification, labor, 46
 - commissions, outside agencies and, 9
 - company, general account, 3
 - expense, 7
 - operating account, 3
 - compressor and air drills, 31
 - construction accounts, new, 9
 - schedule for, 10
 - new, 5
 - consumed, supplies, 17
 - contract book, 44
 - stripping, 38
 - contributions, 34, 39
 - cost of iron ore at the furnace, 4
 - ore at the mines, 6
 - upper ports, 6
 - lower ports, 6
 - cost sheet, general, 6
 - mine, 6
 - crushing ore, breaking and, 34
 - deferred charges, 5, 15
 - depreciation, 15
 - development in ore, 32
 - rock, 32
 - stripping and, 37
 - direct expense, general office, 7
 - mine expense, 7
 - disbursements, 21
 - receipts and, 21
 - distributing accounts, 28
 - district expense, 7

- Oliver Iron Mining Co. (Cont'd)
- districts, iron mining, 1
 - drills, compressor and air, 31
 - drilling and blasting, 37, 38
 - dry and change houses, 33
 - electric power, 28
 - engineers' logs, 28
 - entertainment, traveling and, 9
 - expense accounts, mine accounts, 6
 - mining, open pit mines, 36
 - company, general, 7
 - direct mine, 7
 - district, 7
 - general, 7
 - mining, 39
 - office, direct, 7
 - stripping, 38
 - surface, 34
 - underground, 33
 - hoisting, 33
 - legal, 8
 - mining, 38
 - office, 8, 34, 37, 39
 - operating, 6
 - stockpile, 39
 - track, 37, 38
 - waste pile, 37
 - winter, 36
 - expenses, administration, 28
 - shop, 31
 - special, 9
 - experimental work, 9
 - exploration, mine, 33
 - fixtures, office furniture and, 8
 - furniture and fixtures, office, 8
 - general cost sheet, 6
 - expense, 7
 - company, 7
 - mining expense, 39
 - office, direct expense, 7
 - and mine accounting, 6
 - repairs, 38
 - surface expense, 34
 - underground expense, 33
 - grading highways, 34
 - hand, loading stockpile by, 33
 - mining by, 38
 - stripping by, 37
 - trammings by, 32
 - highways, grading, 34
 - hoisting expense, 33
 - improvements, 12
 - injuries, personal, 34, 39
- Oliver Iron Mining Co. (Cont'd)
- insurance, 13
 - marine, 14
 - inventory accounts, 16
 - invoices, 39
 - iron mines, 1
 - mining districts, 1
 - ranges, 1
 - ore, cost of, at the furnace, 4
 - mining, 1
 - journal entries, miscellaneous, 41
 - labor charges, etc., transfer of supplies, 24
 - classification, 46
 - sheets, 57
 - laboratory, 31
 - ledger, 42
 - accounting, 3
 - sub-general, 5
 - ore, 43
 - stockpile, 44
 - legal expense, 8
 - lighting, 37, 38
 - loading stockpile, steam shovel, 33
 - hand, 33
 - locomotives and cars, repairs to, 37, 38
 - operating, 37, 38
 - log, daily engineers, 28
 - monthly engineers, 28
 - lower ports, cost of ore at, 6
 - ore at, 5, 18
 - machinery rentals, 25
 - manufactured supplies, 17
 - marine insurance, 14
 - mine accounts, expense accounts, 6
 - mine books, underground mines, 26
 - open pit mines, 35
 - cost sheet, 6
 - expense, district, 7
 - exploration, 33
 - general account, 3-5
 - office accounting, reports, etc., 39
 - profit and loss account, 5
 - mines, cost of ore at, 6
 - iron, 1
 - ore at, 5, 18
 - mining captains, 33, 37, 38
 - districts, iron, 1
 - expense, 38
 - expense accounts, open pit mines, 36

Oliver Iron Mining Co. (Cont'd)

- underground mines, 32
 - general, 39
- hand, 38
- iron ore, 1
- ranges, iron, 1
- supplies, 16
- and surface, vouchers charged to, 43
- miscellaneous, 34
 - journal entries, 41
 - profit and loss, 13
- new construction, 5
- office expense, 8, 34, 37, 39
 - furniture and fixtures, 8
 - reports to general, 47
- operating expense, 6
 - locomotives, 37, 38
 - steam shovels, 33, 37, 38
- ore, breaking and crushing, 34
 - development in, 32
 - ledger, 43
 - at lower ports, 5, 18
 - cost of, 6
 - at mines, 5, 18
 - cost of, 6
 - from pockets, shipping, 33
 - and rock statement book, 43
 - stocking and sorting, 33
 - at upper ports, 5, 18
 - cost of, 6
- orebody, removing rock in, 39
- overruns and shortage, 23
- payrolls, 19
 - statistics, 20
- personal injuries, 34, 39
- picking and storing rock, 32
- plant, transfer of, 24
- pockets, shipping ore from, 33
- postage, 8
- power, electric, 28
 - tramming by, 32
- printing and stationery, 8
- production and shipments, 21
 - daily report, 21
 - monthly report, 22
 - steam, 28
- profit and loss, account, 5
 - miscellaneous, 13
 - supplies, 17
- prospecting, 9
- pumping, 33, 38
- purchased, supplies, 18

Oliver Iron Mining Co. (Cont'd)

- railroad tracks, 34
- ranges, iron mining, 1
- receipts, 21
 - and disbursements, 21
- receivable accounts, 6
- records of supplies used, 46
 - transactions, 41
- rentals, 8
 - machinery, 25
- repairs, 31
 - general, 38
 - locomotives and cars, 37, 38
 - steam shovels, 37
- report of production and shipments, daily, 21
 - monthly, 22
- reports to general office, 47
- rock, development in, 32
 - filling, 33
 - picking and storing, 32
 - statement book, ore and, 43
 - in the orebody, 39
- royalty, 5
- salaries, 8
- schedule for construction accounts, 10
- shipping ore from pockets, 33
- shipments, 23
 - production and, 21
 - daily report, 21
 - monthly report, 22
- shop expense, 31
- shortages, overruns and, 23
- shift bosses and timekeepers, 33, 37, 38
- skip tenders, cage and 33
- sorting ore, stocking and, 33
- special expense, 9
- stationery, printing and, 8
- statistics, payroll, 20
- steam production, 28
 - shovel, loading stockpile, 33
 - operation, 33, 37, 38
 - repairs, 37, 38
- stocking and sorting ore, 33
- stockpile expense, 39
 - ledger, 44
 - loading by hand, 33
 - steam shovel, 33
- stopping, 32
- storing rock, picking and, 32
- stripping, 34

Oliver Iron Mining Co. (Cont'd)

- contract, 38
 - and development, 37
- expense, general, 38
 - by hand, 37
- supply accounts, 16
- supplies consumed, 17
 - labor charges etc., a transfer, of, 24
 - manufactured, 17
 - mining, 16
 - profit and loss, 17
 - purchased, 18
 - used, record of, 46
 - vouchers debit and credit to, 42
- surface expense accounts, underground mines, 33
 - general, 34
 - vouchers charged to mining and, 43
- surveying and chemistry, 34, 39
- taxes, 14
- teaming, 31, 37, 38
- telegraph, telephones and, 8
- timbering, 32
- timebooks, 44
- timekeepers, shift bosses and, 33, 37, 38
- track expense, 37, 38
- tracks, railroad, 34
 - underground, 33
- tramming by hand, 32
 - power, 32
- transactions, record of, 41
- transfer of plant, 24
 - supplies, labor charges, etc., 24
- traveling and entertainment, 9
- underground expense, general, 33
- tracks, 33
- upper ports, cost of ore at, 6
 - ore at, 5, 18
- vouchers charged to mining and
 - surface, 43
 - debit and credit to supplies, 42
 - operating, 51
- warehouse, 34, 37, 39
- wastepile expense, 37
- water supply, 37, 38
- winter expense, 36
- work, experimental, 9

Operating accounts, 169

- mine ledger, 150
- schedule for, 130
- expense, 6, 61
- locomotives, 37, 38

Operating Accounts (Cont'd)

- steam shovels, 33, 37, 38
- tramway, 151

Operations, coke, record of, 267

- coke ovens, report of, 256
- comparative statement of, 230
- and development, supplies charged to, 130
- mine, report of, 256
- mine, record of, 267
- monthly report of, 230, 260

Openings, system of numbering mine, 317, 329, 332

Orders, job, 118

- office, 126
- purchase, 123

Ore, breaking, 285

- and crushing, 34
- and coke, delivering expense, 177
- development in, 32
- hoisting, 291
- ledger, 43
- at lower ports, 5, 18
 - cost of, 6
- at the mines, 5, 18
 - cost of, 6
- moistures, 188
- from pockets, shipping, 33
- register, 313
- reserves, calculation of, 333
- and rock statement book, 43
- shipments received, 188
- in stock, 190
- stocking and sorting, 33
- unloading, 179
- at upper ports, 5, 18
 - cost of, 6

Orebody, removing rock in, 39

Other expense, 286

Ovens, charging, 213

- coke, 206
- firing cold, 214
- repairs to coke, 214

Overruns and shortage, 23

Payable, vouchers, 58, 278, 283

Pay checks, 116

Payday curves, 157

Payrolls, 19, 115, 186, 209, 223, 239, 270, 279, 283, 300

- deductions, 223, 242
- deficiency, 209
- distribution of coke oven, 247, 248

Payrolls (Cont'd)
 mine, 244, 248
 statistics, 20
 Pedigree records, 111
 Permanent equipment, 279
 Personal injuries, 34, 39
 claims, 208
 fund, 209
 Physical reports, 312
 Picking and storing rock, 32
 Pipe and fittings, 105
 lines, 287
 Plant account, 283
 transfer of, 24
 steam, 75, 93
 Platting surveys, 328
 Pockets, shipping ore from, 33
 Portland Gold Mining Co., methods of
 accounting, 275
 account, gold, 279
 plant, 283
 stable, 287
 victor mill, 297
 accounts, distributed mine, 288
 head office, ledger, 277
 mine, 282
 receivable, 278, 283
 sub-mine, 285
 accounting, general statement, 297
 ammunition order, 294
 assaying and sampling, 295
 auxiliary hoists, 289
 balance sheet, 281
 blacksmith shop, 288
 boiler room, 288
 breaking ore, 285
 buildings, 286
 carpenter shop and surface, 288
 cars and rails, 287
 capital stock, 278
 cash, 278, 283
 cash book, 297
 compressing, 288
 cost of gold at the mint, 276
 sheet, general, 313
 cross-cuts, 286
 development, 283
 sheets, stope and, 313
 disbursements, receipts and, 281
 distribution of labor, 300
 sheets, 283
 distributed mine accounts, 288
 dividends, 279

Portland Gold Mining Co. (Cont'd)
 unclaimed, 280
 drainage tunnel, 279
 drifts, 286
 drills, machine, 288
 electric plant, 280
 engaging labor, 297
 equipment, permanent, 279
 expense, general, 280, 296
 legal, 280
 mining, 279
 office, 280, 296
 other, 286
 explosives, 287, 294
 financial statement, 280
 fixtures, furniture and, 279
 office, 287
 freight, 286
 fuel, 287, 294
 furniture and fixtures, 279
 general expense, 280, 296
 gold account, 279
 cost of at the mint, 276
 ore, mining and milling, 275
 haulage system, waste, 291
 head office, ledger accounts, 277
 headworks, 287
 hoist report, 290
 hoists, auxiliary, 289
 hoisting, 285, 290
 hospital, 285
 houses, ore, 291
 insurance, 280, 283
 invoices, 307
 labor, distribution of, 300
 engaging, 297
 legal expense, 280
 lighting, 295
 litigation, 280
 loss and gain, 278
 lumber and timber, 287, 294
 machine drills, 288
 shop, 288
 machinery, 287
 machineman's report, 288
 material received register, 307
 mill, Victor, 279
 Portland, 279, 286
 milling, 283
 gold ore, mining and, 275
 mine accounts, 282
 distributed accounts, 288
 sub-accounts, 285

Portland Gold Mining Co. (Cont'd)
 mining expense, 279
 and milling gold ore, 275
 miscellaneous, 280
 office expense, 280, 296
 fixtures, 287
 officers' salaries, 280
 ore, breaking, 285
 houses, 291
 register, 313
 other expense, 286
 payable, vouchers, 278, 283
 payroll, 279, 283, 300
 permanent equipment, 279
 physical reports, 312
 pipe lines, 287
 plant account, 283
 Portland mill, 279, 286
 powderman's report, 294
 printing, stationery and, 280
 profit and loss statement, 281
 property, 278
 pumping, 295
 purchase orders, 307
 rails, cars and, 287
 raises and winzes, 286
 receipts and disbursements, 281
 receivable, accounts, 278, 283
 records, stores, 307
 used, 309
 register, material received, 307
 ore, 313
 voucher, 297
 rents, 280
 repairs, 296
 report, hoist, 290
 machineman's, 288
 powderman's, 294
 shipping, 313
 timberman's, 292
 watchman's, 312
 reports, physical, 312
 salaries, 280
 officers', 280
 sampling, assaying and, 295
 securities, 278
 shafts, 286
 shipping reports, 313
 shop requisitions, 303
 stable account, 287
 statement, financial, 280
 profit and loss, 281
 stationery and printing, 280

Portland Gold Mining Co. (Cont'd)
 stock, capital, 278
 stope and development sheets, 313
 stoping, 283
 stores records, 307
 used records, 309
 storehouse, 287, 307
 supplies, 280, 285, 295
 surface, carpenter shop and, 288
 surveying, 296
 taxes, 280
 timber, lumber and, 287, 294
 timbering, 285, 292
 timberman's report, 292
 timekeeping, 298
 tools and appliances, 287
 trammer's tags, 291
 trammings, 285, 291
 Victor mill, 286
 tunnel, drainage, 279
 unclaimed dividends, 280
 wages, 280
 Victor mill, 279, 297
 trammings, 286
 voucher register, 297
 vouchers payable, 278, 283
 wages unclaimed, 280
 waste haulage system, 291
 watchman's report, 312
 winzes, raises and, 286
 Postage, 8
 and stationery, 62
 Powder report, 159
 Powderman's report, 294
 Power, electric, 28
 and machinery, 206
 drills, 79
 house, 214
 expense, 177
 light and, 76, 94
 trammings by, 32
 Printing and stationery, 8, 208, 280,
 Production and shipments, 21
 report of, 21, 22
 statement, 190
 steam, 28
 Profit and loss, 210, 272, 273
 account, 5
 general, 234
 miscellaneous, 13
 statement, 281
 supplies, 17
 Progress books, 332

- Progress report, 332
- Property, 278
 - cost of, 206
 - engineering, 209
 - mining, 60
- Props, timber and, 212
- Prospecting, 9, 208
 - machinery for, 207
- Pumping, 33, 38, 85, 94, 151, 295
 - expense, 177
- Purchase orders, 123, 307
 - of supplies, 121
- Purchased supplies, 18, 248
- Purchasing agent, office, 105
- Rails, cars and, 287
- Railroad tracks, 34
- Raise and winze card, 321
- Raises and winzes, 286
- Ranges, iron mining, 1
- Recapitulation of shipments, 224
- Receipts, 21, 62
 - boarding house, 208
 - and disbursements, 21, 281
 - and expenditures, boarding house, 252
- Receivable, accounts, 6, 61, 74, 278, 283
 - notes, 61
- Record, boiler room, 174
 - of coal mined, 238
 - electric power, 178
 - freight received, 124
 - hoisting, 86
 - of mine operations, 267
 - of operations, coke, 267
 - power drill, 81
 - rent, 254
 - rock hoisted, 86
 - supplies used, 46, 127
 - tramping, 83
 - of transactions, 41
 - voucher, 108, 180
 - water treatment, 174
 - of yardage, 238
- Records, diamond drilling, 98
 - graphic, 153
 - job, 119
 - office, 338
 - pedigree, 111
 - rent, 93
 - sampling, 161
 - stock, 126
- Records, stores, 307
 - used, 309
 - summary of hoisting, 88
 - supplies, stock, 248
 - survey, office, 327
- Recording engineering data, Calumet & Arizona Mng. Co., 317
 - Boston & Montana Con. C. & S. Mng. Co., 325
 - field notes, 326
 - forms used for, 317, 325
 - geological data, 335
- Reference, labor investigation, 183
- Refinery results, 190
- Register, check, 108
 - material received, 307
 - ore, 313
 - voucher, 297
- Regrinding, 94
- Renewal fund, special, 209
- Rent account, statement of, 254
 - records, 93, 254
- Rental of equipment, 131
- Rentals, 8
 - machinery, 25
- Rents, 89, 95, 208, 280
- Repair of buildings, 178
 - dwelling, 178
- Repairs, 31, 296
 - to buildings, 214
 - and chutes, 212
 - cars, 211
 - coke ovens, 214
 - general, 38
 - to locomotives and cars, 37, 38
 - machinery, 212
 - steam shovels, 37
 - track, 211
- Report, animal, 255
 - blasting, 154, 157
 - of coal mined and distribution, 268
 - coke oven operations, 256
 - compressor, 79
 - coupon, 272
 - daily labor, 164
 - machine, 164
 - development, 134
 - distribution of power drills, 80
 - of drills sharpened, 80
 - drilling, 163
 - electric plant, 76
 - forage, 256

- Report, furnace, 173
 - gas analysis, 174
 - hoist, 290
 - machine drill, 161
 - machineman's, 288
 - mill, 103
 - mine, 133
 - general, 164
 - operations, 256
 - mineral, 103
 - nationality, 134, 256
 - of operations, 230, 260
 - production and shipments, 21, 22
 - progress, 332
 - powder, 159
 - powderman's, 294
 - rock trammed, 83
 - shipped, 66
 - sales, 269
 - shift foreman's, 159
 - shipping, 223, 261, 313
 - smelter, 173
 - steam plant, 75
 - supply, 103
 - of supplies used, 223
 - timberman's, 292
 - tool sharpening, 160
 - trammer bosses, 82
 - watchman's, 312
 - weighmaster's, 261
- Reports, accident, 134
 - boarding house, 223
 - to general office, 47
 - made at general office, 223
 - mineral and mass copper shipped, 67
 - physical, 312
 - received from mines, 222
 - rock shipped, train, 66
- Requisitions, supply, 123
- Results, refinery, 190
- Rock, development in, 32
 - filling, 33
 - hoisted, monthly record, 86
 - summary of, 88
 - house, 88
 - in orebody, removing, 39
 - picking and storing, 32
 - shipped, train reports, 66
 - statement book, ore and 43
 - trammed report, 83
- Rolls, 94
 - rooms and, 211
- Ropes, hoisting, 106
- Royalty, 5
- Rules, aid fund, 70
- Salaries, 8, 62, 280
 - and expense, general office, 207
 - officers, 280
- Sales report, 269
- Saloon buildings, 207
- Sampling, assaying and, 295
 - expense, ore, 179
 - records, 161
- Saw mill, 210
- Schedule for construction accounts, 10, 95
 - development accounts, 130
 - operation accounts, 130
- Screens and elevators, 94
- Securities, 278
- Selling, smelting and, 62
- Settlements, 112
- Shafts, 286
 - and tunnels, 150
- Shift bosses and timekeepers, 33, 37, 38
 - foreman's report, 159
- Shipments, 23
 - of ore received, 188
 - production and, 21
 - reports, 22
 - recapitulation of, 224
- Shipped, coal and coke mine and, 267
- Shipping ore from pockets, 33
 - reports, 223, 261, 313
- Shop accounts, 74
 - expense, 31
 - requisitions, 303
- Shortage, overruns and, 23
- Situation, applying for, 183
- Sketch card, 319
- Sketches, underground, 330
- Skip tenders, cage and, 33
- Slag, hauling expense, 178
- Smelter report, 173
- Smelting copper ore, 168
 - and selling, 62
- Smithing, 210
- Sorting ore, stocking and, 33
- Special expense, 9
- Stable account, 287
- Stamping, 68, 102
- Stamp mill, closed accounts, 93
 - fuel, 106
 - supplies, 106

- Statement, financial, 62, 230, 273, 280
 profit and loss, 281
 of rent account, 254
 Stationery, coupon books and, 270
 postage and, 62
 and printing, 8, 208, 280
 Statistics, payroll, 20
 Steam plant, 75, 93
 report, 75
 production, 28
 shovel, loading stockpile, 33
 operation, 33, 37, 38
 repairs to, 37, 38
 Steel, iron and, 105
 Stock, capital, 58, 278
 ore in, 190
 records, 126
 Stocking and sorting ore, 33
 Stockpile expense, 39
 ledger, 44
 loading by hand, 33
 steam shovel, 33
 Stope books, office, 327
 card, 321
 and development sheets, 313
 maps, 324
 total cards, 320
 Stoping, 32, 98, 150, 283
 Store Co., Wasatch, 203, 268
 fixtures, 269
 Storehouse, 287, 307
 Stores records, 307
 used records, 309
 Storing rock, picking and, 32
 Stripping, 34
 contract, 38
 and development, 37
 expense, general, 38
 by hand, 37
 Sub-accounts, 95
 Subscription, 60
 Sundry labor, 69
 Superintendence and clerks, 212, 213
 Supplies, 74, 152, 181, 223, 280, 285, 295
 construction, charged to, 130
 consumed, 17
 electric, 106
 general, 105
 labor charges, etc., transfer of, 17
 loss and gain on, adjustment, 106
 manufactured, 17
 manufacturing, 106
 Supplies, mining, 16
 operation and development, charged to, 130
 profit and loss, 17
 purchased, 18, 248
 purchase of, 121
 stamp mill, 106
 stock records, 248
 transfer of equipment and, 221
 used, 249
 record, 46, 127
 report, 223
 vouchers, debit and credit to, 42
 Supply accounts, 16
 report, 103
 requisitions, 123
 Surface, carpenter shop and, 288
 expense, 68, 151
 accounts, underground mines, 33
 general, 34
 vouchers charged to mining and, 43
 waste, 152
 Survey calculations, 326
 cards, 318
 office records, 327
 Surveys, platting, 328
 Surveying, 296
 and chemistry, 34, 39
 field books, 325
 System of numbering mine openings, 317, 329, 332
 Tables and vanners, 94
 Taxes, 31, 37, 38, 69, 208, 272, 280
 Team account, company, 88
 Teams and wagons, 269
 Teaming, 31, 37, 38, 74
 timber, 152
 Telegraph, telephones and, 8
 Tests, fuel oil, 176
 Timber, lumber and, 105, 152, 287, 294
 and props, 212
 teaming, 152
 Timbering, 32, 83, 151, 285, 292
 Timberman's report, 292
 Timebooks, 44, 184
 and timekeeping, 112
 Timekeeping, 235, 298
 shift bosses and, 33, 37, 38
 timebooks and, 112
 Tonnage and earnings, 224
 estimated, 268

- Tonnage and labor chart, 152
 Tool sharpening report, 160
 Tools, 106
 and appliances, 287
 Tracings, 324
 Track expense, 37, 38
 repairs to, 211
 Tracks, cars and, 151, 206
 railroad, 34
 underground, 33, 83
 Train reports, rock shipped, 66
 Trammed, report of rock, 83
 Trammer bosses report, 82
 Trammers tags, 291
 Trimming, 82, 151, 285, 291
 by hand, 32
 monthly record of, 83
 of power, 32
 victor mill, 286
 Tramway, chutes and trestles, 206
 new, 151
 operating, 151
 Transactions, record of, 41
 Transfer of equipment and supplies, 221
 plant, 24
 supplies, labor charges, etc., 24
 Transportation, 65
 Traveling and entertainment, 9
 Treasurer, 209, 269
 Treasurer's account, 68
 Trestles, tramways, chutes and, 206
 Trial balance, 62
 Tunnel, drainage, 279
 Tunnels, shafts and, 150
 Unclaimed dividends, 280
 wages, 209, 223, 280
 Underground cars, 83
 expense, general, 33, 85
 sketches, 330
 tracks, 33, 83
 Unloading ore, 179
 Upper ports, cost of ore at, 6
 ore at, 5, 18
 Utah Con. Mining Co., features of
 accounting, 149
 accounts, operating, mine ledger, 150
 blasting report, 154, 157
 boilers, 151
 buildings and fixtures, 151
 cars and tracks, 151
 compressor, 151
 Utah Con. Mining Co. (Cont'd)
 contract curves, 154
 copper ore, mining, 149
 curves, contract, 154
 payday, 157
 development, 150
 drill machine report, 161
 drilling report, 163
 electric lights, 151
 engineering department and labora-
 tory, 151
 expense, general, 151
 surface, 151
 exploring, 150
 explosives, 152
 fixtures, buildings and, 151
 fuel, 152
 general expense, 151
 office, 152
 graphic records, 153
 heating, 151
 hoisting, 151
 labor chart, tonnage and, 152
 report, daily, 164
 laboratory and engineering depart-
 ment, 151
 lights, electric, 151
 lumber and timber, 152
 machine drill report, 164
 report, daily, 161
 machinery, 151
 mine report, daily general, 164
 mining copper ore, 149
 new tramway, 151
 office, general, 152
 operating accounts, mine ledger, 150
 tramway, 151
 payday curves, 157
 powder report, 159
 pumping, 151
 records, graphic, 153
 sampling, 161
 report, blasting, 154, 157
 daily labor, 164
 machine, 164
 drilling, 163
 machine drill, 161
 mine general, daily, 164
 powder, 159
 shift foreman's, 159
 tool sharpening, 160
 sampling records, 161

Utah Con. Mining Co. (Cont'd)
 shafts and tunnels, 150
 shift foreman's report, 159
 stoping, 150
 supplies, 152
 surface expense, 151
 waste, 152
 teaming timber, 152
 timber, lumber and, 152
 teaming, 152
 timbering, 151
 tonnage and labor chart, 152
 tool sharpening report, 160
 tracks, cars and, 151
 trammings, 151
 tramway, new, 151
 operating, 151
 tunnels, shafts and, 150
 waste, surface, 152
 Utah Fuel Co., methods of accounting, 203
 abstract, bills collectable, 215
 voucher, 215
 account, closed, 214
 depreciation, 209
 expense, 269
 general plant, depreciation of, 208
 accounts, ledger, general office, 205,
 206
 Wasatch Store Co., 269
 accounting, general office, 214
 methods of Wasatch Store Co., 269
 mine office, 235
 additional expenditures, details of, 235
 animal reports, 255
 animals, depreciation of, 210
 killed and sold, 209, 223, 255
 auxiliary records, 210, 213
 balance sheet, 234, 273
 bills collectable, 251
 abstract of, 215
 ledger, 215
 boarding house expenditures, 208
 fixtures, 206
 receipts, 208
 receipts and expenditures, 252
 record of meals served, 251
 reports, 223
 books and stationery, coupons, 270
 buildings, 206, 269
 and chutes, repairs to, 212
 repairs to, 214
 saloon, 207

Utah Fuel Co. (Cont'd)
 burning and drawing, 213
 cars, repairs to, 211
 and tracks, 206
 cash book, 214, 268
 charging ovens, 213
 chutes, repairs to buildings and, 212
 and trestles, tramways, 206
 cinders, loading, 214
 clerks, superintendence and, 212 213
 closed account, 214
 coal and coke mined and shipped, 207
 cost to consumers, 204
 expense, sub-accounts, 210
 mined and distribution, report of,
 268
 record of, 238
 mining and making coke, 203
 sales ledger, 215
 used, 213
 coke, cost to consumers, 204
 expense, 207
 sub-accounts, 213
 experiments, 214
 loading, 213
 making, mining coal and, 203
 mined and shipped, coal and, 267
 operations, record of, 267
 ovens, 206
 cost sheet, 224
 repairs to, 214
 collectable, bills, 251
 companies and individuals, 210, 272
 subsidiaries of Utah fuel, 203
 comparative statement of opera-
 tions, 230
 corrections, journal of, 268
 cost of coal to consumers, 204
 coke to consumers, 204
 property, 206
 cost sheet, coke ovens, 224
 mine, 230
 coupon, report, 272
 coupons, books and stationery, 270
 outstanding, 272
 Current liabilities, 274
 dead work, 212
 deductions, payroll, 223, 242
 deficiency, payroll, 209
 depreciation, 222, 272
 account, 209
 of animals, 210

Utah Fuel Co. (Cont'd)
 of general plant account, 208
 details of general expense, 222
 development, mine, 206
 discount and exchange, interest, 209
 distribution of coal mined, report of,
 268
 coke ovens, payrolls, 247, 248
 labor, 238
 mine payrolls, 244, 248
 drainage and watering mine, 211
 drawing, burning and, 213
 driving entry, 211
 earnings, 207, 269
 estimated tonnage and, 268
 tonnage and, 224
 electric lights, 211
 engineering, 212, 213
 property, 209
 entry driving, 211
 equipment, transfer of supplies and,
 221
 exchange, interest, discount and, 209
 expenditures, boarding house, 208
 receipts and, 252
 expense account, 269
 coal, sub-accounts, 210
 coke, 207
 general, 207, 208, 213
 law, 207
 mine, 207
 mining, 210
 expense, details of general, 222
 extraordinary, 216
 general office, salaries and, 207
 experiments, coke, 214
 financial statement, 230, 273
 firing cold ovens, 214
 fixtures, boarding house, 206
 store, 269
 forage report, 256
 fund, personal injury, 209
 special renewal, 209
 general expense, 207, 208, 213
 expenses, details of, 222
 office accounting, 215
 salaries and expenses, 207
 hauling, 210
 improvements, 219
 incidentals, 213, 214
 income account, 231, 234, 273
 individuals and companies, 210, 272

Utah Fuel Co. (Cont'd)
 injury claims, personal, 208
 fund, personal, 209
 insurance, 208, 272
 interest, discount and exchange, 209
 invoices, 216, 250
 journal, 215, 268
 of corrections, 268
 labor distribution of, 238
 lands, 206
 law expense, 207
 ledger, 215, 268
 accounts, Wasatch Store Co., 269
 bills collectable, 215
 coal sales, 215
 liabilities, current, 274
 loading, 211
 cinders, 214
 coke, 212
 machinery for prospecting, 207
 power and, 206
 repairs to, 212
 meals served, record of boarding
 house, 251
 merchandise bought, 269
 sales, 269
 mill-saw, 210
 mine cost sheet, 230
 development, 206
 expense, 207
 office accounting, 235
 operations, record of, 267
 mined, coal and coke, and shipped, 267
 mines, coal, 203
 reports received from, 222
 mining coal and making coke, 203
 expense, 210
 nationality report, 256
 office accounting, general, 215
 general, ledger accounts, 205, 206
 reports made at, 223
 operations, coke, record of, 267
 coke ovens, daily report of, 256
 comparative statement of, 230
 mine, daily report of, 256
 record of, 267
 monthly report of, 230, 260
 ovens, charging, 213
 coke, 206
 firing cold, 214
 repairs to coke, 214
 payrolls, 209, 223, 239, 270

Utah Fuel Co. (Cont'd)

- deductions, 223, 242
- deficiency, 209
- distribution of coke ovens, 247, 248
 - mine, 244, 248
- personal injury claims, 208
 - fund, 209
- power house, 214
 - and machinery, 206
- printing, stationery and, 208
- profit and loss, 210, 272, 273
 - general, 234
- property, cost of, 206
 - engineering, 209
- props, timber and, 212
- prospecting, 208
 - machinery for, 207
- purchased, supplies, 248
- recapitulation of shipments, 224
- receipts, boarding house, 208
 - and expenditures, boarding house, 252
- record of coal mined, 238
 - mine operations, 267
 - operations, coke, 267
 - rent, 254
 - of yardage, 238
- records, supplies, stock, 248
- renewal fund, special, 209
- rent account, statement of, 254
 - record, 254
- rents, 208
- repairs to buildings, 214
 - and chutes, 212
 - cars, 211
 - coke ovens, 214
 - machinery, 212
 - track, 211
- report, animal, 255
 - of coal mined and distribution, 268
 - coke oven operations, daily, 256
 - coupon, 272
 - forage, 256
 - mine operations, daily, 256
 - monthly, 256
 - of operations, monthly, 230, 260
 - sales, 269
 - shipping, 223, 261
 - of supplies used, 223
 - weighmaster's, 261
- reports, boarding house, 223
 - made at general office, 223

Utah Fuel Co. (Cont'd)

- received from mines, 222
- rolls, rooms and, 211
- rooms and rolls, 211
- salaries and expense, general office, 207
- sales report, 269
- saloon buildings, 207
- saw mill, 210
- shipments, recapitulation of, 224
- shipped, coal and coke mined and, 267
- shipping reports, 223, 261
- smithing, 210
- statement, financial, 230, 273
 - of rent account, 254
- stationery and printing, 208
 - coupon books and, 270
- Store Co., Wasatch, 203, 268
 - fixtures, 269
- subsidiary companies, 203
- superintendence and clerks, 212, 213
- supplies, 223
 - purchased, 248
 - stock records, 248
 - transfer of equipment and, 221
 - used, 249
 - report, 223
- taxes, 208, 272
- teams and wagons, 269
- timber and props, 212
- timekeeping, 235
- tonnage and earnings, 224
 - estimated, 268
- track, repairs to, 211
- tracks, cars and, 206
- tramways, chutes and trestles, 206
- transfer of equipment and supplies, 221
- treasurer, 209, 269
- trestles, tramways, chutes and, 206
- unclaimed wages, 209, 223
- ventilation, 211
- voucher abstract, 215
- vouchers, 209, 217, 269
- wages unclaimed, 209, 223
- wagons, teams and, 209
- Wasatch Store Co., 203, 268
 - ledger accounts, 269
- watering mine, drainage and, 211
- weighmaster's report, 261
- work, dead, 212
- yardage, record of, 238

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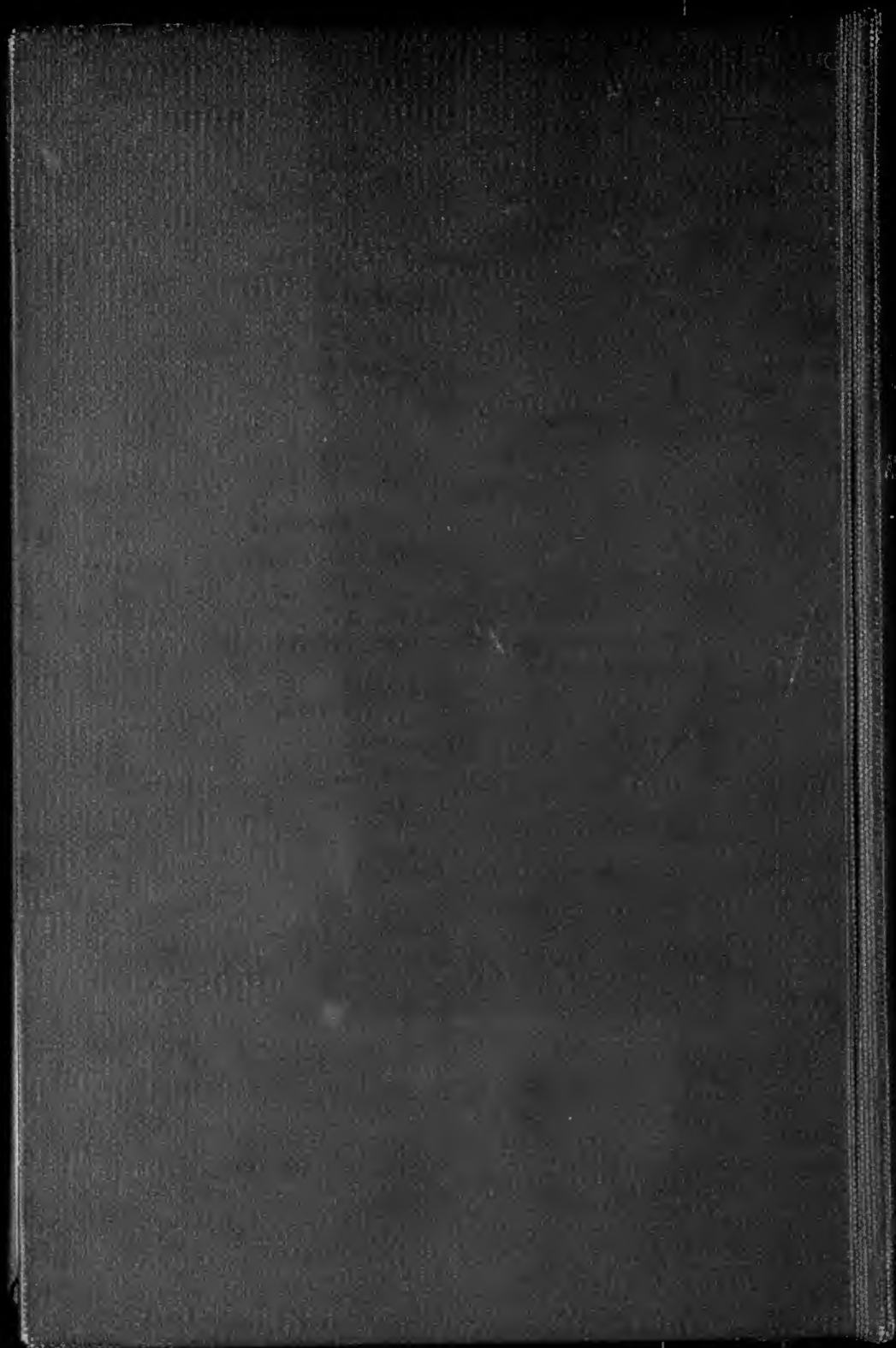
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